

Monsanto

144040
COMPANY CONFIDENTIAL

F. J. Basile, Jr. - WGK

DATE: June 29, 1977

SUBJECT: WASTE DISPOSAL AT THE
WGK SANITARY LANDFILL

TO:

M. A. Pierle - GO (ELSA)

C. F. Buckley
R. L. Harness
P. E. Heisler
M. W. McCombs - 1760
J. W. Molloy
A. Peterson - GO (F3EB)
C. Schrock - GO (F4WE)

000016

In response to your request for a qualitative listing of wastes that have been disposed of at the WGK Sanitary Landfill, I have researched files back through the opening of the landfill in 1959 and have compiled the attached list of wastes disposed of by WGK, JFQ, and Muscatine Plants and by Corporate Research. Please understand that this list may not be all inclusive, but it is the best information that I have been able to assemble and it does serve to indicate the broad use of the landfill.

This list also includes any verbal input that I may have received from some of the key plant personnel who were or have been at WGK over the last eighteen years.

Frank

Frank J. Basile, Jr.

mk
Attachment

K+E

II

Site R

2

#4
B

MCO 0616518

COMPANY CONFIDENTIAL

K 02050

COMPANY CONFIDENTIAL

000017

QUALITATIVE LIST OF WASTES DISPOSED OF AT
THE WCK SANITARY LANDFILL LOCATED ON THE
MISSISSIPPI RIVER FLOOD PLAIN FROM OCTOBER,
1959 TO DATE

4-Nitrodiphenylamine
2-Nitrodiphenylamine
4,4'-Dinitrodiphenylamine
4,4'-Dinitrotriphenylamine
Chlorophenols
Sodium Chlorophenate
Phenols
Sodium Chloride
Sodium Carbonate
Benzyl Chlorophenyl Ether
Dibenzylparachlorophenol
Lime
Paranitroaniline Filter Mud
2,6 Dichlorophenol
2,4 Dichlorophenol
Glycollates
Maleic Anhydride
Polybutene
Methanol contaminated with mercaptans
Orthonitrochlorobenzene
Orthodichlorobenzene
Trichlorobenzene
Dichlorobenzene
Ortho, Meta, and Para Nitrochlorobenzene

MCO 0616519

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K 0205

QUALITATIVE LIST OF WASTES DISPOSED OF AT
THE WCK SANITARY LANDFILL LOCATED ON THE
MISSISSIPPI RIVER FLOOD PLAIN FROM
OCTOBER, 1959 TO DATE

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Page 2.

000018

Ortho and Para Phenetidine

Anisole

Anisidine

Phthalic Anhydride

Benzoic Acid

Miscellaneous solvents from research

Still residue from Cyclamate manufacturing

Salicylic acid and tars

Santicizer 460

Cresyl Diphenyl Phosphate

Bisphenol A

Oil additives

Plasticizers

Dichloroaniline and Still Residue

Trichloro Carbanilide

Chlorobenzol (Tri-Tetrachlor)

Aniline derivatives

Nitrobenzene derivatives

Aromatic carboxylic acids (Maleic, Phthalic, etc.)

Chlorophenol Ether

Water with varying amounts of phenols (0-15%)

Sulfuric acid with chlorophenol

Caustic Soda solution with chlorophenol

Isopropanol - water and chlorinated hydrocarbon

Attapulugus Earth - Keisulguhr from Alkyl Benzene filtration

MCO 0616520

COMPANY CONFIDENTIAL

K 02052

QUALITATIVE LIST OF WASTES DISPOSED OF AT
THE WCK SANITARY LANDFILL LOCATED ON THE
MISSISSIPPI RIVER FLOOD PLAIN FROM
OCTOBER, 1959 TO DATE

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000019

Laboratory samples (to include raw materials, intermediates and
finished goods over the last twenty years)

Amides

TSCl

Toluene Sulfonic Acid plus off-spec TS Acid

Kalcolor

Central Drumming at JFQ

Filter Aids

Lye Scrubber Solution

Isocyanate

Napthalene Residue

Mixture of carbon, C-4, dry old spec product and junk

Para Still Residue (JFQ)

Iron Sludge

Spent Vanadium Catalyst (V_2O_5)

Benzaldehyde

Benzyl Acetate

2,Methyl Diphenyl

Bibenzyl

Benzyl Benzoate

Toluene

Cellulose Flour

Santicizer 856

Mother liquor (PVI)

Varsol (kerosene cut)

Sumithion Residue

Miscellaneous oils and organic solvents and side streams

MCO 0616521

COMPANY CONFIDENTIAL

K 02053

QUALITATIVE LIST OF WASTES DISPOSED OF AT
THE WCK SANITARY LANDFILL LOCATED ON THE
MISSISSIPPI RIVER FLOOD PLAIN FROM
OCTOBER, 1959 TO DATE

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Page 4.

000020

Azo Residue containing: Paraformaldehyde
2, ethylaniline azomethine
2,6, diethylaniline azomethine
2, ethyl-6, butylaniline azomethine
2,6, diethylaniline

Contaminated Monochlorobenzene containing: Methanol
2,6, diethylaniline
2,6, diethylaniline
azomethine

Lasso Batch 7-56B containing: Monochlorobenzene
Chloromethylamide intermediate
2,6 diethylaniline azomethine
unknowns

Ramrod fines containing: 2-chloro-isopropylacetanilide
Attapulgitic Clay

Lasso fines containing: 2 chloro - 2', 6' - diethyl-N-acetanilide
Monochlorobenzene
Attapulgitic Clay

Londox fines containing: 2-chloro-isopropylacetanilide
3-(3,4-dichlorophenyl) -1-methoxy-1
Methylurea
Diethylene Glycol
Attapulgitic Clay

Cresylic Acid Still Residue

Rototherm Residue

Triphenyl Phosphate

Santicizer 154

Santicizer 160

Tricresyl Phosphate

Chlorodiphenyl Phosphate

Chlorophenoxyacetic acids

Polychlorinated Biphenyls

Biphenyl

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K 02054

MCO 0616522

QUALITATIVE LIST OF WASTES DISPOSED OF AT
THE WCK SANITARY LANDFILL LOCATED ON THE
MISSISSIPPI RIVER FLOOD PLAIN FROM
OCTOBER, 1959 TO DATE

COMPANY CONFIDENTIAL

Page 5.

Phenol process wastes containing:

000021

Phenyl Phenols
Sulfones
Sodium Bromo Succinamide
Sulfate Salts
Chloride Salts
Benzene, SO₂, and Sulfuric Acid
Caustic
Sulfite
Salt Cake

Benzyl Chloride

Phosphorus Pentasulfide

Chlor-Alkali Gyp and Sulfide Sludge

Spent sulfuric acid

Phosphorus and "Phossy" water

Parathion

Scrap Sulfur

Orthonitrophenol (Bad batches)

MCO 0616523

ACI

Activated carbon from hydrogen compressor (contaminated with
mercury)

Flyash and Cinders

Miscellaneous discarded equipment such as tanks, piping, pumps,
heat exchangers, etc.

Miscellaneous construction rubble, trash and debris, and
excavation material.

Prepared by:

F. J. Basile, Jr.
6/29/77

mk

K 02055

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#9
G

K

I

~~Site~~ Nonspecific

*8

Site P disposal contract

December 15, 1978

BU
1/4/79

Mr. Paul Sauget
Sauget and Company
2700 Monsanto Avenue
Sauget, Illinois 62201

Dear Paul:

Contract No. 02-03-0563
Agreement for Sanitary Landfill Privileges

Enclosed herewith please find two (2) copies of
subject contract.

Please sign both copies, returning the original to
the writer's attention and keeping the copy for
your files.

Thank you very much.

Sincerely yours,



D. M. Francisco
Purchasing Agent

bp

Enclosures

MCO 0616537

COMPANY CONFIDENTIAL

CONTRACT NO. 02-03-0563RENEWED 1/1/79AGREEMENT FOR SANITARY LANDFILL PRIVILEGES

This Agreement made and entered into as of January 1, 1979, by and between SAUGET AND COMPANY, a Delaware Corporation located in Sauget Village, St. Clair County, State of Illinois, hereinafter called "Sauget" and MONSANTO COMPANY, a Delaware Corporation with General Offices at St. Louis, Missouri, hereinafter called "Monsanto."

WITNESSETH THAT:

WHEREAS, Monsanto operates chemical industries situated in Sauget Village, Centerville Township, St. Clair County, Illinois, and at 1700 South Second Street, St. Louis, Missouri, and desires to dispose of refuse materials from said industries, and

WHEREAS, Sauget is willing to permit the disposal of such refuse by Monsanto on Sauget's Sanitary Landfill upon the terms and conditions hereinafter set out,

NOW, THEREFORE, it is hereby agreed by and between the parties hereto as follows:

1. Sauget agrees as follows:

MCO 0616538

- a) To operate for Monsanto's exclusive use said Sanitary Landfill, located on property leased from Union Electric Company north of Monsanto Avenue and east of the Corps of Engineers Levee between the Illinois Central-Gulf Railroad Track.

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- b) To permit Monsanto to haul to said Sanitary Landfill any or all refuse resulting from the normal operations at Monsanto's Chemical Plants.
- c) To operate said Sanitary Landfill in accordance with the Illinois EPA Rules and Regulations and the operating permit issued to Sauget and Company (#1973-2) on January 11, 1973, by the Illinois EPA.
- d) To allow contractors performing work for Monsanto at its W. G. Krummrich Plant and its J. F. Queeny Plant to haul and dump refuse resulting from such work upon presentation of a permit issued by Monsanto identifying the contractor, the project involved and the term of such project. One permit shall be sufficient for each contractor for each project for the term of such project. Such contractor shall comply with all rules and regulations applicable to said dump, whether promulgated by Sauget or by the Illinois Environmental Protection Agency or otherwise and, in the event that such contractor violates any of said rules and regulations, Sauget may cancel such permit and, if it does so, shall notify Monsanto in writing of such cancellation.
- e) To furnish the services of a dump truck and driver on a not less than forty (40) hour per week basis for the purpose of (1) hauling cover material for the Sanitary Landfill and (2) hauling cinders from the Monsanto Plants for use as cover material and (3)

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providing other services as necessary for the proper operation of the Sanitary Landfill.

f) To furnish the services of a bulldozer and bulldozer operator on a not less than forty (40) hour per week basis for the purpose of compaction and covering of refuse deposited on the Sanitary Landfill site.

g) To permit the unloading of the refuse which Monsanto or its contractors hauls to the Sanitary Landfill on a six day per week basis (Monday through Saturday) including Holidays only between the hours of 8:00 a.m. and 4:30 p.m. At all other times the Sanitary Landfill will be closed and padlocked.

h) To maintain the Sanitary Landfill at all times in such condition as to allow the refuse to be freely unloaded without delay.

i) To maintain at all times access for trucks to dump from the nearest improved road.

j) To wash refuse container boxes at the Sanitary Landfill when requested by Monsanto so long as water is available without cost, for use by Sauget.

k) To hold Monsanto harmless from and indemnify Monsanto against any and all liability, loss or expense that might arise by reason of damage to property or crops or injury to person or persons resulting directly or indirectly from the operation

MCO 0616540

COMPANY CONFIDENTIAL

- 4 -

of said Sanitary Landfill from materials deposited therein or from Monsanto's use thereof.

1) To treat as Monsanto's confidential property and not use or disclose to others during or subsequent to the term of this Agreement, except as is necessary to perform the work hereunder, any information (including any technical information, experience or data) regarding Monsanto's plans, programs, plant processes, products, costs, equipment, operations or customers which may come within the knowledge of Sauget or his employees in the performance of the work or which may developed by Sauget in the course of Sauget's performance of the work without in each instance securing the prior written consent of Monsanto. Nothing herein, however, shall prevent Sauget from disclosing to others or using in any manner information which Sauget can show:

- 1) has been published and has become part of the public domain other than by acts of omissions of Sauget or his employees;
- 2) has been furnished or made known to Sauget by third parties as a matter of right and without restriction on disclosure; or
- 3) was in his possession at the time he entered into this Agreement and which was not acquired by Sauget directly or indirectly from Monsanto, its employees or its agents.

MCO 0616541

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Sauget shall restrict the knowledge of all information regarding the work to as few as possible of his employees (and only to those directly connected with the performing of the work) and shall also, upon request by Monsanto, cause such persons involved in the work on Sauget's behalf as Monsanto designates to sign individual secrecy agreements in a form satisfactory to Monsanto.

m) Scavenging Forbidden. Under no circumstances shall any materials or containers which have been delivered to the Landfill by Monsanto for disposal be scavenged or retrieved for reuse or resale. Sauget covenants that it will use its best efforts to assure that this prohibition is reasonably implemented.

MCO 0616542

2. Monsanto agrees as follows:

a) To pay to Sauget at the end of each month during the year 1979 the sum of Seven Thousand Two Hundred Eighty Two Dollars (\$7,282.00). Sauget to invoice for this amount monthly.

b) To furnish cinders as they are available from the W. G. Krummrich Plant and the J. F. Queeny Plant. Such cinders are to be used as Monsanto deems necessary in the maintenance of the Sanitary Landfill.

c) All dumping at said Sanitary Landfill by Monsanto and by its contractors shall be in conformity with any and all rules and regulations applicable to said

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Sanitary Landfill whether promulgated by Sauget or by the Illinois Environmental Protection Agency or otherwise.

3. This Agreement shall commence with the date set forth at its beginning and shall continue for a period of twelve (12) months unless sooner terminated by either party giving to the other party at least ninety days' written notice of the party's intention to cancel same. This notice period is in the event the Illinois Environmental Protection Agency shall prevent either party from continued performance hereunder.
4. Should this Agreement be terminated prior to December 31, 1979, then payment shall be prorated on the basis of Seven Thousand Two Hundred Eighty Two Dollars (\$7,282.00) per month for the year 1979.

IN WITNESS WHEREOF, this Agreement has been executed on behalf of each party as of the day and year set forth at its beginning.

MONSANTO COMPANY

By

Title

Witness

SAUGET AND COMPANY

By

Title

Witness

MCO 0616543

COMPANY CONFIDENTIAL

8/16/63

000012

ATTACHMENT D - LANDFILL INVENTORY

Information on two attempts to characterize and quantify the waste material disposed of at the landfill were located. These are attached for your use and review.

<u>S(K+E)</u>	# 3
<u>II</u>	B
<u>Steel</u>	
* 2	

Names of materials
disposed

MCO 0616514

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K00001

CONFIDENTIAL

WASTE MATERIALS DISPOSED OF AT
MONSANTO/SAUGET LANDFILL SITE

000013

1. Stabilizer Residue
 - 50% Aromatic Tars
 - 50% Inorganic Iron and Sulfur Compounds
2. Spent Vanadium Catalyst
3. Vacuum Distillation Residue
 - 90% Aromatic Tars
 - 5% Potassium Chloride
 - 5% Potassium Carbonate
4. Phosphate Ester Residue
 - 70% Polymerized Phosphate Ester
 - 18% Organic Tars
 - 12% $MgCl_2$
5. Dry Bleach - Scrap Product
6. Phosphorus Pentasulfide - Scrap Product
7. Spent Activated Carbon
8. Sludge from chlor-alkali sulfide treatment system,
and gyp from brine treatment.
9. Filter Mud
 - 83% Lime
 - 15% Dicalite Filter Aid
 - 2% Dye Residue
10. Still Residue
 - 30% Phenacetin
 - 60% Organic Tars
 - 10% P-chloracetanilid

MCO 0616515

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K00002

000014

11. Still Residue
 - 40% Methyl Salicylate
 - 20% Organic Tars
 - 40% Hydroxy Isophthalate
12. Asprin Powder Scrap
13. Process Residue
 - 85% Sulfones
 - 15% Toluene Sulfonyl Chloride
14. Process Residue
 - 100% Toluene Sulfonamides
15. Filter Cake
 - 97% Carbon
 - 3% Organics
16. Still Residue
 - 20% Iso-Ethavan
 - 30% Ethavan Dialdehyde
 - 50% Organic Tars
17. Process Residue
 - 17% Zinc Chloride
 - 83% Phthalylchloride Fractions
18. Filter Cake
 - 50% Filter Cake
 - 20% Carbon
 - 20% Alumina
 - 10% Solka Flock
19. Filter Cake
 - 50% Dicalite Filter Aid
 - 50% Plasticizer

MCO 0616516

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K00008

000015

20. Filter Cake

50% Santicizer 8
48% Dicalite Filter Aid
2% Carbon

21. Process Residue

80% Benzoic Acid Residue
20% Organic Tars

22. Process Residue

50% Polyethylene Glycol
40% Trimethoxy - Benzaldehyde

23. Santolite MS or MHP

Scrap Product

MCO 0616517

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K00004

B

]

MCO 0616544

APPENDIX B

Index of Documents

Memo dated 2/24/71 re Krummrich Plant Solid Waste Disposal (000041)

Landfill Lease dated 1959 (000042 to 000048)

Letter dated 10/25/77 re Sauget & Company (000049)

Letter dated 11/15/78 re contract addition (000050)

Letter with attachments dated 3/25/80 re on-site waste disposal facilities (000051 to 000064)

Waste disposal agreement dated 11/1/59 (000064 to 000083)

Landfill Lease dated 1/1/64 (000084 to 000091)

Letter with attachment dated 12/29/72 re lease extension (000092 to 000101)

Waste disposal agreement dated 1/1/64 (000102 to 000117)

Lease 1/1/64 (000118 to 000124)

Waste disposal agreement dated 1/1/64 (000125 to 000140)

Memo dated 3/6/73 re waste disposal contract (000141 to 000161)

Memo dated 9/2/60 re landfill operation procedures (000162 to 000168)

Chemical waste disposal operations manual undated (000169 to 000172)

Memo dated 8/5/74 re landfill inspection (000173)

MCO 0616545

Land Fill
C. F. Buckley - Krummrich

February 24, 1971

P. E. Heisler

SOLID WASTE DISPOSAL

C. D. Bohl

The W. G. Krummrich Plant disposes of its solid waste to local landfills. "Toxic" chemical wastes are hauled to a fenced area which is Monsanto property. The operation of this landfill is contracted to Sauget and Company of Sauget, Illinois. Chemical waste is accepted from J. F. Queeny Plant and General Offices as well. Each location makes its own arrangement for hauling. Trash, etc. is hauled to Sauget and Company's own landfill on the same basis; i.e., we make our own arrangements for hauling and contract the disposal.

I enclose the operating procedure for the chemical wastes written in 1960. The procedure remains basically the same but some details have been revised subsequently.

State laws apply as there are no County or local regulations. However, there is some confusion between State departments on the application of the law to chemical wastes and we expect changes in the near future. As yet, we have seen no proposals to the Pollution Control Board so we do not know what form it will take. Complete prohibition of toxic liquid waste disposed in landfills is the most likely course to be adopted.

Also attached is progress report 91341:9002 #3, giving the present level of waste disposal from WGK.

pd
Attachments

C. F. Buckley

MCO 0616546

Sauget and Company

2700 MONSANTO AVENUE
SAUGET, ILLINOIS 62206



0000:9

October 25, 1977

*Do not
Type only*

Mr. D. M. Francisco
Purchasing Supervisor
Monsanto Company
Sauget, Illinois 62201

Dear Mr. Francisco:

I would like to propose that the present contract remain in effect through 1978 with no changes, if agreeable to you.

Thank you for your consideration.

Sincerely,

PAUL SAUGET

PS/bjl

K
II
Star
* 1

* 3
A

MCO 0616556

bcc: G. F. Knollmeyer - 1760
E. D. Malone - 1760
J. W. Molloy - WGK
L. P. Russe - WGK
W. L. Sullivan - WGK
B. R. Williams - WGK

000050

November 15, 1978

Mr. Paul Sauget
Sauget and Company
2700 Monsanto Avenue
Sauget, Illinois 62201

Dear Paul:

Contract No. 02-03-0563
Agreement for Sanitary Landfill Privileges

This letter is to confirm our phone conversation of November 14, 1978 agreeing that the following paragraph will become part of the terms and conditions of the subject agreement:

1. Sauget agrees as follows:

(e) Sub. 4. Scavenging Forbidden. Under no circumstances shall any materials or containers which have been delivered to the Landfill by Monsanto for disposal be scavenged or retrieved for reuse or resale. Sauget covenants that it will use its best efforts to assure that this prohibition is reasonably implemented.

Paul, thank you for your interest and cooperation in this subject.

Very truly yours,


D. M. Francisco
Purchasing Agent

MCO 0616557

bp

11/27/77 2:11 PM
Monsanto

FILE W.G.K. LINDALL
MONSANTO CHEMICAL INTERMEDIATES CO.
Saugat, Illinois 62201
Phone: (618) 271-5835

000051

March 25, 1980

Kenneth G. Mensing
Environmental Protection Agency
Division of Land/Noise
Pollution Control
115A West Main
Collinsville, IL 62234

Refer to: Letter from EPA to R. Sinise--2/25/80

Dear Mr. Mensing:

Your letter requested data from W. G. Krummrich concerning our on-site waste disposal facilities as referenced in the Eckhardt Report. W.G. Krummrich Plant has had three on-site disposal facilities since 1950. A copy of the Eckhardt report summary for each of these three sites is attached (Addendum A). This summary represents our best knowledge concerning quantity and composition of the waste and the time frame the facility was in use.

The landfill site used from 1957 to 1973 is the landfill your office and the Federal EPA visited several months ago. Geologic, monitoring, closure procedures, and location has been transmitted to you in two separate letters since that visit. The only additional information available is the attached summary of the hydrogeologic data (Addendum B) made by D'Appoloma Engineering.

The second landfill was used from 1950 to 1957. Enclosed is a plant map that indicates the location of this site (Addendum C). Geologic information, closure procedures, and groundwater data is not existing for this site. This site is now covered by a parking lot and a process plant.

The third facility is an incinerator that was operational from 1971 to 1977. The information you requested is not applicable to this site. Please indicate if there is any special information required for the incinerator.

Sincerely,

R. Sinise
Richard H. Sinise

MCO 0616559

RHS:bag
Enclosure

Illinois

XXXXXXXXXXXX, Director



000032

Environmental Protection Agency



2200 Churchill Road, Springfield, Illinois 62706

Telephone: (618) 345-0700

Address Reply To:

115A W. Main

Collinsville, Ill. 62234

Refer to: St. Clair County - LPC 163 121 02 - Sauget/Monsanto

February 25, 1980

Richard Sinise
Environmental Control Section
Monsanto, Krummrich Plant
Sauget, Illinois 62201

Dear Mr. Sinise:

I am writing this letter as a result of your telephone conversation with John DeSelm of this Agency on February 22, 1980.

The Illinois Environmental Protection Agency is compiling information on sites listed in the Eckhart Report. This report, you will recall, requested basic information on disposal practices of major U. S. companies of which Monsanto was one.

The information IEPA is requesting concerning your on-site disposal facilities is:

- location (a diagram of the plant grounds locating the facilities would be helpful)
- geologic and hydrogeologic information
- monitoring capabilities
- facility design criteria
- disposal practices (i.e.; landfill, open dump, burning, was daily cover applied, etc.)
- closure procedures and post closure monitoring (if any)
- time frame the facility was used
- composition of waste streams disposed
- quantity of waste streams disposed

Any of the above information or other pertinent information you can supply will be appreciated. Thank you for your time and consideration.

Sincerely,

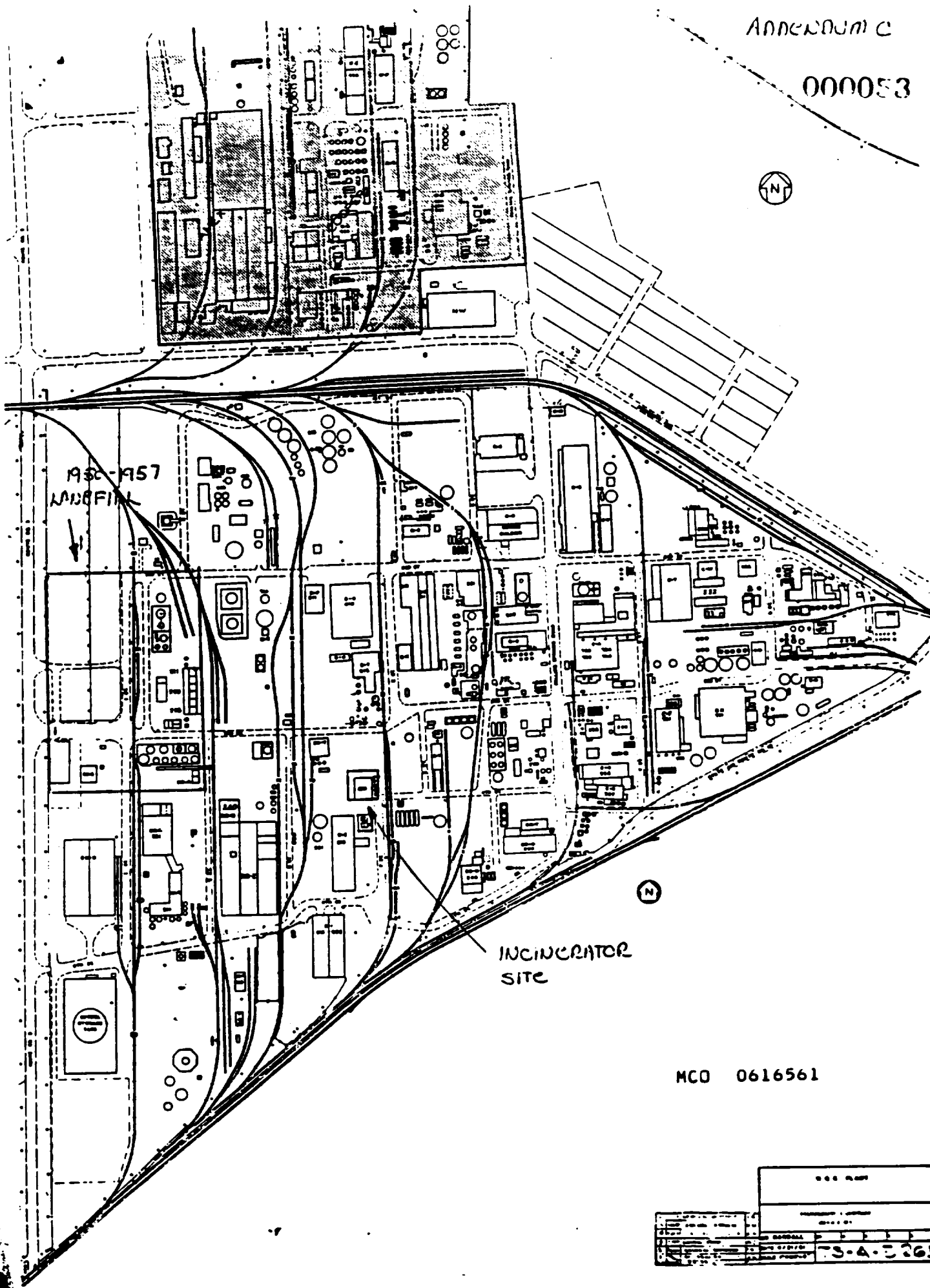
Kenneth G. Mensing

Kenneth G. Mensing, Southern Region Manager
Land Field Operations Section
Division of Land/Noise Pollution Control

MCD 0616560

KGM:JJD:jlr

cc: Division File
Southern Region



1950-1957
MURFILL

INCINERATOR
SITE

2

MCO 0616561

TS-A-326.

SEE MAP	
REVISIONS	
NO.	DATE
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2	1951
3	1952
4	1953
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6	1955
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569	2518

4.0 GROUNDWATER

Groundwater levels were observed by the installation and monitoring of standpipe piezometers during the subsurface investigation. Nineteen wellpoints were installed and the depths of the wellpoints and the recorded water levels are shown in Figures 3 and 4. The groundwater levels were measured each day during the investigation. The changes in water levels in the deep piezometers corresponded closely with the change in the Mississippi River level measured at the Eads Bridge gage north of the site. This direct connection between the river and the principal groundwater at the site would be expected due to the clean medium sand layer. The shallower piezometers in the alluvium indicate the presence of localized perched groundwater as would be expected in the interbedded sands, silts, and clays.

The exact direction and rate of flow of the groundwater in the aquifer has not been determined because precise elevations of the piezometers have not been measured. Based on the piezometer data available, piezometric levels across the site are very flat. Under normal conditions, groundwater flow in the aquifer would be expected to be downriver with a component toward the river. Using estimated "normal" piezometric levels and permeability of the aquifer, average flow velocities in the aquifer probably are in the range of 10 to 100 feet per month.

4.1 HYDROLOGIC PROPERTIES

Four, falling-head field permeability tests were conducted to evaluate the alluvial materials. Two additional tests were attempted, but the materials were so permeable that no measurements could be made. The results of these field tests are presented in Table 1.

The results of these field tests, field observations, and laboratory measured permeability show that the alluvium is very permeable. This supports the conclusion that the silty sand is the continuous material in the alluvium and also explains the apparent movement of leachate from the landfill downward to the aquifer.

The subsurface profiles shown in Figures 3 and 4 were generalized from and interpolated between the test borings. The nature of the upper soil unit (alluvium) is so variable from boring to boring that the sections are somewhat speculative. The alluvium has been shown as sand and silty sand containing lenses of silty clay. The boring log data could also be interpreted as indicating silty clay containing sand and silty sand lenses. However, because of the apparent movement of leachate through the alluvium, the continuity of the less permeable silty clay seems less likely than the continuity of the silty sand.

The detailed boring logs are shown in Figures 5 through 10. Each boring log indicates the locations of the samples, the soil profile description, appropriate Unified Soil Classification System (USCS) classification of each sample, and the results of the penetration resistance tests.

In general, the borings indicate that the subsurface strata consist of three different sequences: miscellaneous fill; interbedded layers of fine sand, silt and clay; and a clean, medium to coarse sand sequence.

The fill consists of 5 to 20 feet of fly ash, cinders, silty clay, sand and gravel, as well as miscellaneous material such as glass, scrap metal, and unidentified waste.

The alluvium, interbedded fine sand, silt and clay underlying the fill, ranges from 15 to 50 feet in total thickness. The alluvium is indicative of changing river channels with the fine-grained materials intertonguing. The leachate which has been carried down is usually concentrated just above the contacts between a silty sand layer overlying a silty clay layer. The thickness of these various layers is usually thin, on the order of a few feet.

Underlying the alluvium is a thick sequence of medium to coarse sand. Although none of the borings drilled for this study extended to bedrock, this sand layer is expected to continue to bedrock. Cobbles and boulders were encountered in the deeper portions of the borings.

map indicates that areas of silty and clayey soils predominate on the American Bottoms, although relatively sandy soils are present in a narrow strip along the Mississippi River and near Sauget, Cahokia, and Centreville. Logs of previous borings at the site provided by Monsanto (Figure 2) and others published by the Illinois State Geological Survey indicate that soils in the upper 5 to 10 feet of the profile are relatively clayey.

Subsurface Soils (Aquifer)

The better sorted (more poorly graded) soils of the subsurface consist of sand and gravel from the base of the alluvium (10 to 30 feet deep) to the bedrock surface at 100 to 120 feet deep. These sediments were deposited by glacial meltwaters under much higher river flows than those that exist today. The high energy regime of sedimentation produced a coarser, better sorted deposit (outwash) than the alluvium of the present-day channel. Ice-contact deposits were mixed in with the outwash and show up as poorly sorted lenses or lentils of clayey and silty sediment. These ice-contact deposits are rare, however, and do not detract from the high permeability/transmissibility of the aquifer.

3.0 SUBSURFACE INVESTIGATION

During the period from October 31 to December 1, 1977, 20 test borings were drilled by Layne-Western Drilling Company, Inc., of Kirkwood, Missouri, under the full-time supervision of D'Appolonia. In addition to the test borings, eight auger borings were drilled for the purpose of installing piezometer standpipes. The locations of these borings are shown in Figure 3. During this investigation, a total of 1295 lineal feet of soil sampling and drilling was completed and 1005.5 lineal feet of piezometer pipe installed. The borings were drilled using two truck-mounted CME 55s and a CME 750. During the drilling, Standard Penetration Tests (SPT) were conducted while obtaining split-barrel samples of the soil. Continuous samples were obtained in the top 30 feet and samples were taken at 5-foot intervals below 30 feet. In addition, 11 three-inch-diameter undisturbed Shelby tube samples of the fine-grained soil materials underlying the site were obtained.

MCO 0616564

swamps have been formed by channel migration and flooding. Six miles to the east, the flood plain is abruptly bordered by an upland whose boundary with the flood plain is marked by 150-foot-high, loess-covered bluffs. The noticeable features on the flood plain near the river are industrial sites, storage areas, and railroad yards. Urban areas are present farther away from the river edge and cropland is dominant toward the bluff line.

The topography of the landfill area has been modified between the western boundary and the river by an earth and ash dike and beyond the east boundary by a government levee (Figure 2). The area of the Krummrich landfill itself, however, had apparently been unaltered before the placement of wastes began. The original surface was relatively flat with a maximum relief of 5 feet.

2.2 SOILS OF THE AMERICAN BOTTOMS

The American Bottoms at the Krummrich site has approximately 100 to 120 feet of unconsolidated valley fill over bedrock (limestone) of Mississippian age. There are two main soil units. The upper unit consists of clayey silt with fine sand and is recent alluvium (Cahokia Alluvium); the lower unit consists of medium coarse sand and gravel and is glacial outwash (Henry Formation). Although there is a considerable intertonguing of alluvium and outwash as well as lentils of more or less clayey material in the outwash, the alluvium generally comprises the upper 15 to 30 feet of the valley fill. The soils below 30 feet are better sorted than the alluvium above and comprise the major aquifer of the region.

Surface Soils (Aquitard)

The surface soils in the St. Clair County flood plain have been mapped by the University of Illinois Agricultural Experiment Station, and their soils units reflect, in general, the grain-size analysis, slope and drainage characteristics of the soils in the upper 80 inches of the profile. The U.S. Soil Conservation Service is in the process of updating the soils mapping, but their report is not yet published. The 1938 soils

SUBSURFACE INVESTIGATION
SANITARY LANDFILL
W. G. KRUMMRICH PLANT
MONSANTO COMPANY
SAUGET, ILLINOIS

000058

1.0 INTRODUCTION

In May 1977, E. D'Appolonia Consulting Engineers, Inc. (D'Appolonia) issued a report describing a preliminary assessment of the sanitary landfill operated by Monsanto at the W. G. Krummrich plant site. This assessment was based on published information from various state and federal agencies and data supplied by Monsanto. The report considered the environmental impact of the landfill, the effect of shutdown of the adjacent Ranney well, and the alternatives available for closing the landfill.

Following Monsanto's review of the preliminary assessment, D'Appolonia was authorized to proceed with a detailed subsurface investigation to determine actual soil conditions at the site and the extent of leachate movement from the landfill. These data were to provide the basis for more rigorous evaluation of the alternatives for closing, securing, and monitoring the landfill.

2.0 GEOLOGY

2.1 TOPOGRAPHY

The W. G. Krummrich plant sanitary landfill is located in Sauget, St. Clair County, Illinois, across the Mississippi River from St. Louis, Missouri (Figure 1). The landfill site is located at the edge of the Mississippi River on a broad, flat flood plain, locally called the American Bottoms. The flood plain is approximately six miles wide at the site and is at approximately Elevation 400 to 410. The slope of the plain is about 0.5 foot per mile down river. The flood plain is almost featureless topographically, although meander scars, ox-bow lakes, and

MCO 0616566

TOP SECRET CONTAIN

Facility Name: W. G. Krummrich

Site Name: W. G. Krummrich

000059

9. Components (or characteristics) of process waste from this facility disposed at site: (1=present in waste; 2=not present in waste; 9=don't know)

FILL IN EVERY BLOCK SPACE

Acid solutions, with pH < 3	1	(10)
pickling liquor	9	(11)
metal plating waste	9	(12)
circuit etchings	9	(13)
inorganic acid manufacture	1	(14)
organic acid manufacture	9	(15)
Base solutions, with pH > 10	9	(16)
caustic soda manufacture	9	(17)
nylon and similar polymer generation	2	(18)
scrubber residual	9	(19)
Heavy metals & trace metals (bonded organically & inorganically)	1	(20)
arsenic, selenium, antimony	2	(21)
mercury	1	(22)
iron, manganese, magnesium	2	(23)
zinc, cadmium, copper, chromium (trivalent)	2	(24)
chromium (hexavalent)	2	(25)
lead	2	(26)
Radioactive residues, > 3 pico curies/liter	2	(27)
uranium residuals & residuals for UFG recycling	2	(28)
lanthanide series elements and rare earth salts	2	(29)
phosphate slag	2	(30)
thorium	2	(31)
radium	2	(32)
other alpha, beta & gamma emitters	2	(33)
Organics	1	(34)
pesticides & intermediates	1	(35)
herbicides & intermediates	9	(36)
fungicides & intermediates	9	(37)
rodenticides & intermediates	9	(38)
halogenated aliphatics	1	(39)
halogenated aromatics	9	(40)
acrylates & latex emulsions	9	(41)
PCB/PBB's	9	(42)
amides, amines, imides	9	(43)
plastizers	9	(44)
resins	9	(45)
elastomers	9	(46)
solvents polar (except water)	9	(47)
carbontetrachloride	9	(48)
trichloroethylene	9	(49)
other solvents nonpolar	9	(50)
solvents halogenated aliphatic	1	(51)
solvents halogenated aromatic	9	(52)
oils and oil sludges	9	(53)
esters and ethers	9	(54)
alcohols	9	(55)
ketones & aldehydes	9	(56)
dioxins	9	(57)
Inorganics	9	(58)
salts	9	(59)
mercaptans	9	(60)
Misc.	7	(61)
pharmaceutical wastes	9	(62)
paints & pigments	9	(63)
catalysts (eg. vanadium, platinum, palladium)	1	(64)
asbestos	2	(65)
shock sensitive wastes (eg. nitrated toluenes)	9	(66)
air water reactive wastes (eg. P ₄ , aluminum chloride)	1	(67)
wastes with flash point below 100° F.	9	(68)

MCO 0616567

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

000060

Company Name: Monsanto
Facility Name: W.G. Krummrich
Name of Site: W.G. Krummrich
Address of Site: Route 3

no. street
Sauget, IL 62201
city state zip code

Name of Owner (while used by facility): Monsanto
Address: 800 N. Lindbergh
no. street

St. Louis MO 63201
city state zip code

Current Owner (if different from above):
Address: _____
no. street
city state zip code

1. Location (1= the property on which facility is located; 2= off-site)..... ☐ (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ☐ (11)
3. Current status (1= closed; 2= still in use; 9=don't know) ☐ (12)
IF CLOSED, specify year closed 1951 (13-15)
4. Year first used for process waste from this facility 1951 (15-17)
5. Year last used for process waste from this facility (enter "79" if still in use) 1951 (17-19)
6. Total amount of process waste from this facility disposed at site:
thousand gallons ☐ ☐ ☐ ☐ ☐ ☐ (19-27)
hundred tons ☐ ☐ ☐ ☐ ☐ ☐ (27-34)
thousand cubic yards ☐ ☐ ☐ ☐ ☐ ☐ (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)-----
landfill, mono industrial waste ☐ (42)
landfill, mixed industrial waste ☐ (43)
landfill, drummed waste ☐ (44)
landfill, municipal refuse co-disposed ... ☐ (45)
pits/ponds/lagoons ☐ (46)
deep well injection ☐ (47)
land farming ☐ (48)
incineration ☐ (49)
treatment (eg. neutralizing)..... ☐ (50)
reprocessing/recycling ☐ (51)
other (specify) ☐ (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ☐ (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

* Don't know

** If record or information available for determination is estimated

MCO 0616568

Facility Name: W. G. Krummrich

Site Name: Monsanto Landfill

000061

9. Components (or characteristics) of process waste from this facility disposed at site: (1=present in waste; 2=not present in waste; 9=don't know)

FILL IN EVERY BLOCK SPACE

Acid solutions, with pH < 3.....	1	(10)
pickling liquor	2	(11)
metal plating waste	2	(12)
circuit etchings	2	(13)
inorganic acid manufacture	1	(14)
organic acid manufacture	2	(15)
Base solutions, with pH > 10	1	(16)
caustic soda manufacture	1	(17)
nylon and similar polymer generation	2	(18)
scrubber residual	2	(19)
Heavy metals & trace metals (bonded organically & inorganically)	2	(20)
arsenic, selenium, antimony	2	(21)
mercury	1	(22)
iron, manganese, magnesium	1	(23)
zinc, cadmium, copper, chromium (trivalent)	2	(24)
chromium (hexavalent)	2	(25)
lead	2	(26)
Radioactive residues, > 3 pico curies/liter	2	(27)
uranium residuals & residuals for UF ₆ recycling	2	(28)
lanthanide series elements and rare earth salts	2	(29)
phosphate slag	2	(30)
thorium	2	(31)
radium	2	(32)
other alpha, beta & gamma emitters	2	(33)
Organics.....	1	(34)
pesticides & intermediates	1	(35)
herbicides & intermediates	1	(36)
fungicides & intermediates	1	(37)
rodenticides & intermediates	2	(38)
halogenated aliphatics	1	(39)
halogenated aromatics	1	(40)
acrylates & latex emulsions	2	(41)
PCB/PBB's	1	(42)
amides, amines, imides	1	(43)
plastizers	1	(44)
resins	2	(45)
elastomers	2	(46)
solvents polar (except water)	1	(47)
carbontetrachloride	1	(48)
trichloroethylene	1	(49)
other solvents nonpolar	1	(50)
solvents halogenated aliphatic.....	1	(51)
solvents halogenated aromatic	1	(52)
oils and oil sludges	2	(53)
esters and ethers	1	(54)
alcohols	1	(55)
ketones & aldehydes	1	(56)
dioxins	2	(57)
Inorganics	1	(58)
salts	1	(59)
mercaptans	2	(60)
Misc.....	1	(61)
pharmaceutical wastes	2	(62)
paints & pigments	2	(63)
catalysts (eg. vanadium, platinum, palladium)	1	(64)
asbestos	2	(65)
shock sensitive wastes (eg. nitrated toluenes)	2	(66)
air water reactive wastes (eg. P ₄ , aluminum chloride)	1	(67)
wastes with flash point below 100° F.....	1	(68)

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

000062

Company Name: Monsanto
Facility Name: W.G. Krummrich
Name of Site: Monsanto Landfill
Address of Site: Route 3

no. street
Sauget, IL 62201
city state zip code

Name of Owner (while used by facility): Monsanto
Address: 800 N. Lindbergh
no. street

St. Louis MO 63141
city state zip code

Current Owner (if different from above):
Address: no. street
city state zip code

1. Location (1= the property on which facility is located; 2= off-site)..... ☒ (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ☒ (11)
3. Current status (1= closed; 2= still in use; 9=don't know) ☒ (12)
IF CLOSED, specify year closed 1978 (13)
4. Year first used for process waste from this facility 1957 (15)
5. Year last used for process waste from this facility (enter "79" if still in use) 1978 (17)
6. Total amount of process waste from this facility disposed at site:
thousand gallons ☐ ☐ ☐ ☐ ☐ ☐ (19)
hundred tons ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ (27)
thousand cubic yards ☐ ☐ ☐ ☐ ☐ ☐ (34)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
landfill, mono industrial waste ☒ (42)
landfill, mixed industrial waste ☒ (43)
landfill, drummed waste ☒ (44)
landfill, municipal refuse co-disposed ... ☒ (45)
pits/ponds/lagoons ☒ (46)
deep well injection ☒ (47)
land farming ☒ (48)
incineration ☒ (49)
treatment (eg. neutralizing)..... ☒ (50)
reprocessing/recycling ☒ (51)
other (specify) ☐ (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ☒ (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

MCO 0616570

Facility Name: W.G. Krummrich
Site Name: W.G. Krummrich

000063

9. Components (or characteristics) of process waste from this facility disposed at site: (1=present in waste; 2=not present in waste; 9=don't know)

FILL IN EVERY BLOCK SPACE

Acid solutions, with pH < 3	2	(10)
pickling liquor	2	(11)
metal plating waste	2	(12)
circuit etchings	2	(13)
inorganic acid manufacture	2	(14)
organic acid manufacture	2	(15)
Base solutions, with pH > 10	2	(16)
caustic soda manufacture	2	(17)
nylon and similar polymer generation	2	(18)
scrubber residual	2	(19)
Heavy metals & trace metals (bonded organically & inorganically)	2	(20)
arsenic, selenium, antimony	2	(21)
mercury	2	(22)
iron, manganese, magnesium	2	(23)
zinc, cadmium, copper, chromium (trivalent)	2	(24)
chromium (hexavalent)	2	(25)
lead	2	(26)
Radioactive residues, > 3 pico curies/liter	2	(27)
uranium residuals & residuals for UF ₆ recycling	2	(28)
lathanide series elements and rare earth salts	2	(29)
phosphate slag	2	(30)
thorium	2	(31)
radium	2	(32)
other alpha, beta & gamma emitters	2	(33)
Organics	1	(34)
pesticides & intermediates	2	(35)
herbicides & intermediates	2	(36)
fungicides & intermediates	1	(37)
rodenticides & intermediates	2	(38)
halogenated aliphatics	2	(39)
halogenated aromatics	1	(40)
acrylates & latex emulsions	2	(41)
PCB/PBB's	1	(42)
amides, amines, imides	2	(43)
plastizers	1	(44)
resins	2	(45)
elastomers	2	(46)
solvents polar (except water)	1	(47)
carbontetrachloride	2	(48)
trichloroethylene	2	(49)
other solvents nonpolar	1	(50)
solvents halogenated aliphatic	2	(51)
solvents halogenated aromatic	1	(52)
oils and oil sludges	2	(53)
esters and ethers	2	(54)
alcohols	2	(55)
ketones & aldehydes	1	(56)
dioxins	2	(57)
Inorganics	2	(58)
salts	2	(59)
mercaptans	2	(60)
Misc	2	(61)
pharmaceutical wastes	2	(62)
paints & pigments	2	(63)
catalysts (eg. vanadium, platinum, palladium)	2	(64)
asbestos	2	(65)
shock sensitive wastes (eg. nitrated toluenes)	2	(66)
air water reactive wastes (eg. P ₄ , aluminum chloride)	2	(67)
wastes with flash point below 100° F.	2	(68)

MCO 0616571

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

ADDENDUM A

000064

Company Name: Monsanto
Facility Name: W.G. Krummrich
Name of Site: W.G. Krummrich - Incinerator
Address of Site: Route 3

no. street

Sauget, IL 62201
city state zip code

Name of Owner (while used by facility): Monsanto

Address: 800 N. Lindbergh
no. street

St. Louis MO
city state zip code

Current Owner (if different from above):

Address: no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site)..... ☐ (1)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ☐ (1)
3. Current status (1= closed; 2= still in use; 9=don't know) ☐ (1)
IF CLOSED, specify year closed 1977 (1)
4. Year first used for process waste from this facility 1971 (1)
5. Year last used for process waste from this facility (enter "79" if still in use) 1977 (1)
6. Total amount of process waste from this facility disposed at site:
thousand gallons ☐ ☐ ☐ ☐ ☐ (1)
hundred tons ☐ ☐ ☐ ☐ ☐ 511 (2)
thousand cubic yards ☐ ☐ ☐ ☐ ☐ (3)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
landfill, mono industrial waste ☐ (4)
landfill, mixed industrial waste ☐ (4)
landfill, drummed waste ☐ (4)
landfill, municipal refuse co-disposed ... ☐ (4)
pits/ponds/lagoons ☐ (4)
deep well injection ☐ (4)
land farming ☐ (4)
incineration ☐ (4)
treatment (eg. neutralizing)..... ☐ (5)
reprocessing/recycling ☐ (5)
other (specify) ☐ (5)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ☐ (5)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

MCO 0616572

Monsanto

MONSANTO INDUSTRIAL CHEMICALS CO.
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166
Phone: (314) 694-1000

December 29, 1972

Sauget & Company
2700 Monsanto Avenue
Sauget, Illinois

RE: EXTENSION OF LEASE

Gentlemen:

Reference is hereby made to that certain Lease dated January 1, 1970, with a term of three years, between Monsanto Company as Lessor and Sauget & Company as Lessee by which Monsanto leased certain lands situated in the Village of Sauget, County of St. Clair, State of Illinois, bounded on the North by Riverview Avenue; on the East by a 230 KV transmission line of Union Electric Company; on the South by other land of Monsanto and on the West by an existing unimproved road, containing approximately 22 acres and more particularly described in said Lease.

This letter will serve to indicate our agreement to extend the term of the above mentioned Lease for an additional period of three years, expiring on December 31, 1975.

All the other terms, conditions and provisions contained in said Lease shall continue in full force and effect during all of said extended term, unless sooner terminated as provided in paragraph 7 of said Lease.

If this letter properly expresses our agreement with respect to the extension of said Lease, please so indicate by

VAULT COPY

Return to Office
of the Secretary

Sauget & Company

- 2 -

December 29, 1972

signing on the line provided below and by returning a copy
to the writer.

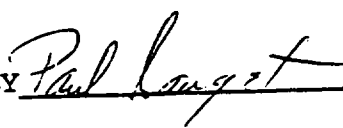
Yours very truly,

MONSANTO COMPANY

BY  psp

Extension Accepted and
Agreed to as of
December 29, 1972:

SAUGET & COMPANY

BY 

MCO 0616604

VAULT COPY

Return to Office
of the Secretary

000094

LEASE

between

MONSANTO COMPANY

and

SAUGET AND COMPANY

dated

January 1, 1970

for

Waste Disposal

W. G. Krummrich Plant

Sauget, Illinois

MCO 0616605

L E A S E

THIS INDENTURE, made and entered into as of January 1, 1970, by and between MONSANTO COMPANY, a Delaware corporation, of St. Louis, Missouri, hereinafter referred to as "Lessor," and SAUGET AND COMPANY, a Delaware corporation, of 2700 Monsanto Avenue, Sauget, Illinois, hereinafter referred to as "Lessee," WITNESSETH:

WHEREAS, Lessor owns certain lands situated on and near the east bank of the Mississippi River in the Village of Sauget, St. Clair County, State of Illinois, and

WHEREAS, Lessee desires to lease a portion of said lands, as hereinafter described, for use by Lessee as site for Lessee's waste disposal operations which are to be performed pursuant to the terms and provisions of that certain written Agreement, of even date herewith, between Lessor and Lessee, hereinafter called "Waste Disposal Agreement," to which Agreement reference is hereby made; and

WHEREAS, Lessor is willing to lease said lands for said purposes under the terms and conditions hereinafter set forth,

NOW, THEREFORE, the parties hereto agree as follows:

1. Lessor, in consideration of the covenants and agreements hereinafter expressed to be kept, observed and performed by Lessee, and subject to the terms, provisions and conditions hereof, does hereby let, and the Lessee does hereby lease, the following described parcel of land, hereinafter called "Premises," situated in the Village of Sauget, County of St. Clair, and State of Illinois, to-wit:

A tract of land in the Village of Sauget, County of St. Clair, State of Illinois, said tract being bounded on the north by the southern line of River-view Avenue, 70 feet wide, as established by Ordinance No. 122 of the Village of Sauget, Illinois; bounded on the east by the western line of 230KV transmission line easement for Union Electric Power Company, recorded in Book 1284, page 28 of the

St. Clair County, Illinois recorder's office; bounded on the south by the south line of Monsanto Company property, said line being parallel with and measured at right angles thereto, approximately 2000 feet southerly from the said southern line of Riverview Avenue; bounded on the west by the eastern line of an existing unimproved road running generally parallel to the aforesaid transmission line easement at an elevation varying from 418 feet to 423 feet above mean sea level between said southern line of the herein described tract and the southern line of Riverview Avenue, said tract containing approximately twenty-two (22) acres and being located approximately where shown outlined in red on Monsanto Company's drawing No. D-179-G1, Revision 1, dated December 15, 1969, marked Exhibit "A", attached hereto and made a part hereof.

2. This lease is made subject to any and all rights or interests of third parties in or to any of said Premises. Lessor shall have the right to enter upon said Premises at all reasonable hours for the purpose of examining and inspecting the same. Lessor further reserves the right (a) to keep, maintain, operate, and renew Lessor's existing sampling wells on said Premises and to install, construct and thereafter keep, maintain, operate and renew such additional sampling wells as Lessor may desire, and (b) to keep, maintain, renew, relocate and remove Lessor's existing metal fence located on or about said Premises, and to install, construct and thereafter keep, maintain, renew, relocate and remove such additions or extensions to, or changes in, said fence as Lessor may consider necessary or convenient. Lessee agrees to cause all gates comprised in any fence, now existing or which may hereafter be erected or maintained on or about said Premises, to be closed and securely locked at all times except during such periods as Lessee shall actively be conducting operations on said Premises in accordance with said Waste Disposal Agreement.

3. Lessee agrees to maintain and use said Premises solely for the purpose of operating thereon a waste disposal area in accordance with the terms and provisions of the aforesaid Waste Disposal

Agreement. Lessee expressly agrees to refrain from, as well as prevent, the disposal of any other materials, wastes or residues on said Premises. 000097

4. Lessee agrees not to use said Premises for any unlawful purpose, to comply with and observe the provisions of any law, ordinance or governmental regulation applicable to Lessee's use of said Premises, and to prevent unauthorized persons from entering on said Premises. No buildings, structures or improvements shall be installed, constructed, erected or placed on said Premises without the prior written consent of Lessor.

5. Lessee shall not be charged any rent for its use of the said Premises in accordance with the provisions hereof.

6. Lessee shall defend, indemnify and hold harmless Lessor from and against any and all liability, claims, causes of action, suits, judgments, fines, penalties, losses, damages, costs and expenses of whatever kind or character arising out of, resulting from or connected with (a) Lessee's use or occupancy of or operations on said Premises for any purpose, (b) the exercise by Lessee of any of the rights or privileges granted hereby, (c) the maintenance, operation, use or existence of said Premises as a disposal area, (d) any act, omission or neglect of Lessee, its agents, representatives or employees, or (e) any breach by Lessee of the terms or provisions of this Lease; provided, however, the foregoing provisions of this paragraph 6 shall not apply to any injuries to person or property caused by or resulting from the sole negligence of the Lessor in the operation or maintenance of the Premises.

7. This Lease shall commence with the date first hereinabove written, and end with December 31, 1972 unless sooner terminated, as it may be at any time, by either party giving at least ninety (90

days' written notice to the other party of intention to terminate. Notwithstanding any of the foregoing, it is expressly agreed that in the event said Waste Disposal Agreement shall be cancelled, terminated or otherwise expire, this Lease shall terminate ipso facto with the cancellation, termination or other expiration of said Waste Disposal Agreement. In addition, Lessor may, without further demand or notice, terminate this Lease in the event Lessee defaults in the performance of or breaches any of its covenants, obligations or agreements under this Lease, and such default or breach shall continue for more than ten (10) days after written notice thereof shall have been given by the Lessor to Lessee.

Upon termination howsoever of this Lease, Lessee shall peacefully deliver up and surrender possession of said Premises to Lessor, leaving the same in a neat, clean, orderly and safe condition and, provided Lessee shall have satisfied all of its liabilities to Lessor hereunder, Lessee shall remove all of Lessee's property from said Premises. In the event Lessee fails to peaceably deliver up and surrender said Premises to Lessor as aforesaid, Lessor may, without further demand or notice, re-enter and repossess said Premises and expel Lessee and those claiming under it without being guilty of trespass and without being subject to liability for damages and without prejudice to any other remedies of the Lessor at law or in equity then existing with respect thereto

8. If Lessee remains in possession of the Leased Premises after the expiration of the term hereof, with Lessor's acquiescence and without any express agreement of the parties, a monthly tenancy terminable by either party on not less than one month's notice shall be created, which shall be upon the same terms and conditions, including rent, as those herein specified, and there shall be no renewal of this Lease by operation of law.

9. Any notice of Lessor to Lessee shall be deemed served or given when posted on Premises or when deposited, postage prepaid, in the U. S. mails addressed to Lessee at its address stated above.

10. This Lease and all its provisions shall inure to or bind each party's successors and assigns; provided that none of the Premises shall be sublet and no right of Lessee shall be transferred or assigned, either voluntarily or involuntarily, without the prior written consent of Lessor. Either party hereto may waive any default at any time of the other without affecting or impairing any right arising from any subsequent default.

IN WITNESS WHEREOF, the parties hereto have duly executed this Lease as of the day and year first hereinabove written.

MONSANTO COMPANY

ATTEST:

By

C. B. Hollman
Assistant Secretary

By

J. M. Finkler
Vice President

SAUGET AND COMPANY

ATTEST:

By

Paul Sauget
Secretary

By

Ed Sauget
President

MCD 0616610

STATE OF MISSOURI)
) SS
 COUNTY OF ST. LOUIS)

I, Jean C. Munier, a notary public, do hereby certify that H. L. Minshall, personally known to me to be the Vice President of Monsanto Company, a Delaware corporation, and C. B. Holman personally known to me to be the Assistant Secretary of said corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that as such Vice President and Assistant Secretary, they signed and delivered the said instrument as Vice President and Assistant Secretary of said corporation, and caused the corporate seal of said corporation to be affixed thereto, pursuant to authority given by the Board of Directors of said corporation as their free and voluntary act, and as the free and voluntary act and deed of said corporation, for the uses and purposes therein set forth.

Given under my hand and official seal, this 29th day of June, 1970.

Commission expires May 21, 1972.

Jean C. Munier

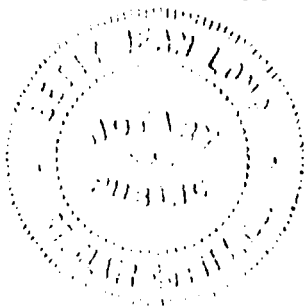
MCO 0616611

STATE OF ILLINOIS)
) SS
 COUNTY OF ST. CLAIR)

I, Betty Jean Long, a notary public, do hereby certify that Leo Sauget, personally known to me to be the _____ President of Sauget and Company, a Delaware corporation, and Paul Sauget personally known to me to be the _____ Secretary of said corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that as such _____ President and _____ Secretary, they signed and the said instrument as _____ President and _____ Secretary of said corporation, and caused the corporate seal of said corporation to be affixed thereto, pursuant to authority, given by the Board of Directors of said corporation as their free and voluntary act, and as the free and voluntary act and deed of said corporation, for the uses and purposes therein set forth.

Given under my hand and official seal, this 26th day of May, 1970.

Commission expires 12/11/73.



Betty Jean Long

MCO 0616612

WASTE DISPOSAL AGREEMENT

This Agreement made and entered into as of the first day of January, 1964, by and between MONSANTO COMPANY, a Delaware corporation, of St. Louis, Missouri, (hereinafter called "Monsanto") and INDUSTRIAL SALVAGE AND DISPOSAL, INC., a Delaware corporation, of 2902 Monsanto Avenue, Monsanto, Illinois, (hereinafter called "Industrial"),

WITNESSETH:

WHEREAS, by an Indenture of Lease of even date herewith Industrial has leased from Monsanto a tract of land of approximately twenty-two acres located near the east bank of the Mississippi River in the Village of Monsanto, Illinois, (hereinafter called the "Leased Property"); and

WHEREAS, Industrial proposes to operate on the Leased Property a sanitary landfill dump (hereinafter called the "Dump") to provide for the disposal of certain chemical waste materials of Monsanto;

NOW, THEREFORE, in consideration of the mutual covenants herein contained and for good and valuable other consideration, Monsanto and Industrial hereby agree as follows:

1. Operation of Dump. Industrial shall operate the Dump on the Leased Property in accordance with the procedures, terms and provisions set forth in the Specifications attached hereto and made a part hereof. Monsanto, at its own expense, shall arrange for the trucking of the chemical wastes from its chemical plants to the site of the Dump, and for the unloading of such wastes at the Dump. Industrial shall furnish and provide all labor and other personnel and all materials and equipment necessary for the proper operation of the Dump. Monsanto shall notify Industrial of the Monsanto employee (hereinafter called the "Engineer") who is authorized to represent Monsanto under this Agreement.

2. Removal of Drums. In connection with its operation of the Dump, Industrial has requested permission from Monsanto to remove and salvage, at Industrial's risk and expense, certain empty metal drums used to transport chemical waste materials to the Dump.

MCO 0616613

WASTE DISPOSAL AGREEMENT

This Agreement made and entered into as of the first day of January, 1964, by and between MONSANTO COMPANY, a Delaware corporation, of St. Louis, Missouri, (hereinafter called "Monsanto") and INDUSTRIAL SALVAGE AND DISPOSAL, INC., a Delaware corporation, of 2902 Monsanto Avenue, Monsanto, Illinois, (hereinafter called "Industrial"),

WITNESSETH:

WHEREAS, by an Indenture of Lease of even date herewith Industrial has leased from Monsanto a tract of land of approximately twenty-two acres located near the east bank of the Mississippi River in the Village of Monsanto, Illinois, (hereinafter called the "Leased Property"); and

WHEREAS, Industrial proposes to operate on the Leased Property a sanitary landfill dump (hereinafter called the "Dump") to provide for the disposal of certain chemical waste materials of Monsanto;

NOW, THEREFORE, in consideration of the mutual covenants herein contained and for good and valuable other consideration, Monsanto and Industrial hereby agree as follows:

1. Operation of Dump. Industrial shall operate the Dump on the Leased Property in accordance with the procedures, terms and provisions set forth in the Specifications attached hereto and made a part hereof. Monsanto, at its own expense, shall arrange for the trucking of the chemical wastes from its chemical plants to the site of the Dump, and for the unloading of such wastes at the Dump. Industrial shall furnish and provide all labor and other personnel and all materials and equipment necessary for the proper operation of the Dump. Monsanto shall notify Industrial of the Monsanto employe (hereinafter called the "Engineer") who is authorized to represent Monsanto under this Agreement.

2. Removal of Drums. In connection with its operation of the Dump, Industrial has requested permission from Monsanto to remove and salvage, at Industrial's risk and expense, certain empty metal drums used to transport chemical waste materials to the Dump.

MCO 0616613

Monsanto hereby grants such permission to Industrial on the following terms and conditions:

(a) Industrial may remove from the Dump, at its own risk and expense, such number as it determines of empty metal drums that Monsanto's Engineer designates to be surplus drums, but solely for the purpose of selling the same to reputable steel scrap companies as scrap metal or to reputable salvage companies for cleaning and reclaiming. Industrial shall not sell or otherwise dispose of any of said drums to any other person, firm or corporation, and shall not remove any of said drums from the Dump for any other purpose.

(b) Any drums that are removed from the Dump by Industrial shall be removed by the end of the working day during which they are received at the Dump. Any drums not removed by Industrial pursuant to paragraph 2(a) above shall be crushed and buried by Industrial in the Dump.

(c) Industrial has been informed that the drums have been used for the storage of chemical wastes and of the possible hazards connected therewith. Industrial hereby acknowledges that it assumes responsibility for the further handling and use of the drums removed from the Dump. Industrial shall take all necessary precautions to insure that the removal and disposition of such drums, and the subsequent handling and disposition of such drums by any such steel scrap or salvage company, will not endanger the safety of, or constitute a hazard to any persons or property. Industrial further agrees to notify in writing each steel scrap or salvage company to which it may sell any of said drums of such prior use of said drums, and will attempt to obtain a similar agreement from said company that it will take necessary safety precautions and that it will warn subsequent handlers and users of the drums.

(d) Monsanto shall have the right at any time to cancel, or suspend for a specified period of time, such permission by giving at least two days' prior written notice to Industrial.

3. Price. In full payment for Industrial's entire performance of its work under this Agreement, Monsanto shall pay to Industrial each month the sum of Three Thousand Dollars (\$3,000.00).

4. Payment Procedure. Invoices for the monthly payment shall be submitted to the Engineer by Industrial on or about the first day of each month. The invoices shall be in such form and supported by such evidence as the Engineer may direct, including evidence satisfactory to the Engineer that all payrolls, materials bills and other indebtedness connected with the work under this Agreement to date have been paid. Within ten days after receipt of such invoice in proper form, Monsanto shall pay to Industrial the amount due for the preceding calendar month.

5. Safety and Miscellaneous Provisions.

(a) Industrial shall strictly comply with all safety provisions set forth in the Specifications. Industrial shall take all other necessary steps and precautions for the safe operation and maintenance of the Dump. Industrial shall cause all gates in the fences erected on the Leased Property to be closed and securely locked at all times except during such periods as Industrial shall be conducting operations at the Dump.

(b) In operating the Dump, Industrial shall observe and comply with all applicable Federal, State and local laws and regulations.

(c) In operating the Dump and performing its work under this Agreement, Industrial shall be an independent contractor and shall have complete control of all of its employees and operations. All personnel employed by Industrial shall be employees of Industrial and not of Monsanto, and Monsanto shall have no right to direct or supervise such personnel.

(d) Monsanto and Industrial agree that, in the event of changes in the wage rates of Industrial's personnel or the premature need for replacement of Industrial's equipment employed on the work under this Agreement, either party shall have the right to renegotiate the Price specified herein on the

MCO 0616616

anniversary date of this Agreement by giving to the other party at least thirty days prior written notice of its desire to renegotiate.

6. Indemnity Provisions. Industrial shall defend, indemnify and hold harmless Monsanto from and against any and all liability, claims, causes of action, suits, judgments, fines, penalties, losses, damages, costs and expenses of whatever kind or character arising out of injuries to or the death of any person or damage to or destruction of any property, caused by or resulting from or connected with (a) the maintenance or operation of the Dump unless caused by the sole negligence of Monsanto, or (b) the removal or disposition by Industrial of drums from the Dump or other activities of Industrial pursuant to this Agreement.

7. Insurance by Industrial. Industrial shall take out and maintain, during the term of this Agreement and for such period thereafter as Monsanto shall specify upon termination, the following insurance:

(a) Workmen's Compensation and Occupational Disease Insurance in an amount equal to the limit of liability and in the form prescribed by the laws of Illinois for all of Industrial's employees engaged in work in connection with the operation of the Dump and the removal and disposition of drums. To the extent that any such employees are not protected by such a statute, Industrial shall also provide Employer's Liability Insurance in an amount not less than \$100,000 for injury to, or for the death of, any one employee, and subject to the same limitation for each employee, in an amount not less than \$300,000 on account of any one accident.

(b) Public Liability Insurance covering claims for injuries to or death of persons or damage to or destruction of property arising from the maintenance or operation of said Dump or the removal and disposition by Industrial of said drums, whether such operations be by Industrial or any person directly or indirectly employed by Industrial, and covering liabilities assumed by Industrial pursuant to paragraph 6 above. The

amount of such insurance shall be not less than:

(i) \$150,000 for injury to, or for the death of, any one person; and, subject to the same limitation for each person, in an amount not less than \$500,000 on account of any one accident; and (ii) \$100,000 for damage to property on account of each accident, or \$200,000 in the aggregate in respect of damage to property.

(c) Automobile Public Liability and Property Damage Insurance covering all owned or rented automotive equipment used by Industrial in the performance of this Agreement. Such liability insurance shall be in an amount not less than \$100,000 for injury to, or for the death of, any one person, in an amount not less than \$300,000 on account of any one accident. Property damage limits with respect to such insurance shall be not less than \$50,000 for each accident.

Such insurance shall be in form satisfactory to Monsanto and Industrial shall furnish to Monsanto certificates of such insurance satisfactory to Monsanto. Each contract of insurance shall contain the following clause:

"No reduction, cancellation or expiration of the policies providing the above coverages shall become effective until ten days from the date written notice is actually given to Mr. B. B. Byrne, Purchasing Agent, Monsanto Chemical Company, Wm. G. Krummrich Plant, Monsanto, Illinois."

All policies of insurance shall be countersigned by a duly authorized and accredited agent, or agents, of the carrier residing in the State of Illinois. All insurance shall be carried with insurance companies which, in the case of mutual companies, have a surplus to policyholders in excess of one million dollars (\$1,000,000) and in the case of stock companies, which have total capital and surplus in excess of one million dollars (\$1,000,000).

8. Term and Termination. This Agreement shall commence as of the date first hereinabove written and shall expire on December 31, 1963 unless sooner terminated, as it may be at any time, by either party giving at least ninety days' written notice to the other party of its intention to terminate. A termination of this Agreement shall not relieve Industrial of its obligations as set forth in paragraphs 6 and 7 above.

9. Prior Negotiations. This Agreement and the Indenture of Lease of even date herewith sets forth the entire agreement of Monsanto and Industrial with respect to the subject matter hereof. This Agreement shall supersede the Agreement dated November 1, 1959 between Monsanto and Industrial. All prior negotiations regarding the subject matter hereof shall be deemed to be merged herein.

IN WITNESS WHEREOF, Industrial and Monsanto have each caused this Agreement to be executed by its duly authorized representative as of the day and year first above written.

MONSANTO COMPANY

By /s/ B. B. Byrne P. A. /s/ PSP

INDUSTRIAL SALVAGE AND DISPOSAL, INC.

By /s/ Paul Sauget Sec.

SPECIFICATIONS

OPERATION OF
SANITARY LANDFILL DUMP
W. G. KRUMMRICH PLANT
MONSANTO COMPANY
MONSANTO, ILLINOIS

Prepared By
Functional Maintenance Department

MCO 0616620

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Section B - Supplementary Conditions	B-1 thru B-5
Section C - Drawing List	C-1

SECTION AOperation of Sanitary Landfill DumpA. Scope

1. The work to be performed is the operation of a Sanitary Landfill Dump on the River Terminal property owned by Monsanto and leased to Industrial by an Indenture of Lease dated as of January 1, 1964.

B. Location

1. The dump is to be located South of Riverview Avenue and East of Monsanto's river front tank farm. This location is as shown on Drawing D-017-G10.

C. Equipment

1. Industrial shall furnish all equipment necessary for the operation of the Sanitary Landfill Dump. This includes the operation and maintenance of such equipment.

D. General Operating Instructions

1. The materials to be encountered in the operation of the dump will fall within two groups, i.e., solids and liquids. To facilitate unloading operations within the dump site, the groups shall be separated according to group and unloaded in areas designated by the Engineer.

Liquid materials shall be discharged onto levelled receiving areas approximately 30 feet wide by 120 feet long. These areas shall be enclosed on all four sides by a retaining wall of cover material. The liquid shall then be blended and compacted with sufficient cover material to produce a stable fill. The area shall then be levelled and the retaining walls adjusted to receive the next load of liquid waste.

Solids, i.e., drummed solids and granular materials, shall be deposited in the designated area, covered and compacted. Drums are to be punctured before compacting into the fill.

It shall be understood that occasional tests or trials may become necessary as new types of wastes and new methods of operations are introduced. If such tests indicate a revision in operational procedure the revision will be adopted as directed by the Engineer.

MCD 0616622

2. Cover Material. Cover and filling material will be secured from the Krummrich Plant Power Department or the fly-ash ponds south of Monsanto's present tank farm area. Material will be trucked to the dump and stored as directed by the Engineer.
3. Appearance and Scavenging: It shall be necessary to keep the dumps smooth and neat in appearance at all time. No scavenging shall be permitted except with the permission of Monsanto's Engineer.
4. Fire Protection: Hose lines shall be provided at the dump at all times. It shall be necessary to wet down the dump to control fires and dust. The hose lines shall be connected to the fire hydrants in the River Terminal Area.
5. Use of Dump: This dump shall be operated by Industrial for the sole use of Monsanto.

SECTION B

MONSANTO COMPANY

SUPPLEMENTARY CONDITIONSA. General Provisions1. Job Site Location

Monsanto Company, William G. Krummrich Plant, Monsanto, Illinois.

2. Definitions

The word "Engineer" as used throughout the Specifications means the individual employed by Monsanto and authorized by Monsanto to represent it on this work.

3. Responsibility

In all operations under the Agreement, Industrial shall respect, adhere to and comply with all local and general ordinances and laws controlling or limiting in any way actions of those engaged upon the work.

Industrial shall secure and pay for all permits and licenses required by the laws in effect at the time of the execution of the work. Industrial, however, shall notify the Engineer of his intent to secure such permit or license prior to making application to enable Monsanto to determine if such permit or license is actually required under the law.

Any person employed on the work who shall neglect to obey the regulations imposed by Monsanto or who shall be deemed to be incompetent, or shall be guilty of any disorderly conduct or shall commit any trespass on any public or private property in the vicinity of the work, shall be at once removed from the work by Industrial, when so requested by the Engineer.

Industrial shall at all times enforce strict discipline and good order among its employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

4. Interference with Plant Operation

MCO 0616624

Industrial shall confine its activities to the areas set aside for it to do its work and shall not interfere with any of Monsanto's activities. Unless specifically authorized by the Engineer, Industrial's employees are prohibited from

entering any plant area except those areas to which they are assigned. Prohibited areas for Industrial's employees include operating departments, washrooms, maintenance shops, offices and cafeterias.

5. Cameras

Both taking of pictures and the possession of a camera in the Plant are prohibited.

6. Monsanto Equipment

Monsanto equipment will not be loaned to Industrial's employees.

B. Special Provisions

1. Storage of Material

The receipt and storage of Industrial's materials (not furnished by Monsanto) will be the responsibility of Industrial. Outdoor storage space will be available to Industrial but it will not be permitted to store material except within the areas indicated on the plans or as directed by the Engineer.

2. Telephone

Telephone service, if desired, must be arranged and paid for by Industrial.

3. Toilet Facilities

Job toilet facilities may be provided by Industrial. These facilities shall be constructed and used in a manner that will not violate any sanitary regulations or cause any inconvenience or nuisance to Monsanto or its employees. The type of toilet facilities provided by Industrial will be subject to the approval of the Engineer. No facilities are available on the River Front Property.

4. Water

Industrial will furnish suitable drinking water for its personnel. Drinking water is not available on the River Front Property.

C. Safety Provisions

All work or operations must conform with established Monsanto practices in order to insure the maximum in safety and fire precautions. Information concerning such practices in each area will be secured from the Engineer.

All safety and security regulations of Monsanto's Wm. G. Krummrich Plant shall be observed without deviation by all of Industrial's employees. Some of these regulations are listed below.

1. Smoking

Smoking is prohibited in the Plant except in designated posted smoking areas at which locations electric lighters are provided. Having possession of matches or lighters is prohibited. At the discretion of Industrial smoking time may be allowed the workmen but they shall extinguish butts in sand buckets or containers provided before leaving the smoking area.

2. Aisles and Exits

Aisles, safety showers, fire equipment, alleys, streets and exits must be kept free of obstructions.

3. Excavations; Overhead Work

Industrial shall provide all guards, barricades, lights, etc., necessary for the safety of Plant operations and personnel.

All excavations shall be barricaded each time Industrial's workmen quit for the day. Openings, ditches, etc., must be roped off and danger signs placed. Adequate danger lighting must be provided at night.

4. Traffic Rules

- a. The speed limit is 15 M.P.H.
- b. Vehicles shall stop at all stop signs.
- c. Vehicle and equipment operators shall observe all railroad crossings and switch signs and follow the instructions on them.

5. First Aid

First-aid and emergency treatment for all injuries incurred by Industrial's employees should be received at Monsanto's Dispensary. Industrial shall promptly notify the Engineer of any injury to Industrial's employees and shall assist the Engineer in filling out the Accident Report Form for the Safety Department of Monsanto.

6. Fire Protection

Industrial shall, in all of its operations, conform to all fire regulations in effect for the Wm. G. Krummrich Plant. He shall do no burning, welding, grinding or any other flame or spark-producing operation, operate equipment of any kind or proceed with any work requiring the use of the inflammable substances (such as gasoline, kerosene, paint thinners, or any liquids with closed-cup flashpoint below 110°F.) without first securing a Monsanto fire permit and complying with the conditions and instructions specified thereon. The permits required will be supplied by the Engineer.

Should a hazardous condition develop in the area, Industrial shall, at the request of any Monsanto employee, stop all cutting, welding or other spark-producing activities.

7. Fire

Industrial shall familiarize all personnel working directly or indirectly under him with the following rules to be followed in case of fire:

- a. To report a fire -- go to any plant telephone, dial Station 200 and give the designation of the building or area in which the fire is located.
- b. If the fire alarm (siren) sounds while personnel are driving in the Plant, they shall pull over to the side of the road and stop.
- c. Visiting at the scene of a fire or accident by personnel other than members of fire or emergency crews is prohibited.
- d. In case of a fire on the job site for which the Fire Department is called, all personnel other than Industrial's supervisors shall immediately leave the area. The supervisors shall keep themselves available to assist the Fire Department.

8. Industrial Hazards

Industrial shall acquaint itself with the industrial hazards, if any, to be encountered in each particular area. Information pertaining to such hazards shall be obtained through the Engineer.

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9. Pipes

Process piping shall never be used either to support an individual worker or to support staging. If it becomes necessary for a ladder to be leaned against a pipe to accomplish some work, permission of the Engineer shall first be secured.

10. Wiring

No wiring should be cut without consulting the Engineer. Any wire accidentally broken should be reported immediately to the Engineer or Monsanto's Electrical Foreman.

11. Clean-Up of Job

Industrial must keep the area of its work clean and promptly remove any excess materials or equipment.

12. Use of Intoxicants

Persons judged to be under the influence of intoxicating beverages will not be admitted into the Plant. The carrying of intoxicating beverages into the Plant is prohibited. Violation of this regulation will result in immediate and permanent removal of the employee from the Plant property.

13. Railroad Clearances

When it is necessary to work adjacent to a switch track, care must be taken that equipment and material do not encroach on the clearance area required by law. This is 8'6" on both sides of the track. Overhead clearance is 22'6" above top of the rail. All equipment and materials must be removed from these clearances at the end of each work day unless arrangements have been made to the contrary.

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SECTION C
Drawing List

The following drawing has been prepared by the Organic Chemicals Division of the Monsanto Company:

<u>DWG.</u>	<u>REV.</u>	<u>DATE</u>	<u>TITLE</u>
D-017-G10	0	3/31/59	River Terminal Sanitary Landfill Dump

MCO 0616629

L E A S E

THIS INDENTURE, made and entered into as of January 1, 1964, by and between MONSANTO COMPANY, a Delaware corporation, of St. Louis, Missouri, hereinafter referred to as "Lessor", and INDUSTRIAL SALVAGE AND DISPOSAL, INC., a Delaware corporation, of 2902 Monsanto Avenue, East St. Louis, Illinois, hereinafter referred to as "Lessee", WITNESSETH:

WHEREAS, Lessor owns certain lands situated on and near the east bank of the Mississippi River in the Village of Monsanto, St. Clair County, State of Illinois, and

WHEREAS, Lessee desires to lease a portion of said lands, as hereinafter described, for use by Lessee as site for Lessee's waste disposal operations which are to be performed pursuant to the terms and provisions of that certain written Agreement, of even date herewith, between Lessor and Lessee, hereinafter called "Waste Disposal Agreement," to which Agreement reference is hereby made, and, further, for agricultural purposes; and

WHEREAS, Lessor is willing to lease said lands for said purposes under the terms and conditions hereinafter set forth.

NOW, THEREFORE, the parties hereto agree as follows:

1. Lessor, in consideration of the covenants and agreements hereinafter expressed to be kept, observed and performed by Lessee, and subject to the terms, provisions and conditions hereof, does hereby let, and the Lessee does hereby lease, the following described parcel of land, hereinafter called "Premises," situated in the Village of Monsanto, County of St. Clair, and State of Illinois, to-wit:

A tract of land in the Village of Monsanto, County of St. Clair, State of Illinois, said tract being bounded on the north by the southern line of River-view Avenue, 70 feet wide, as established by Ordinance No. 122 of the Village of Monsanto, Illinois; bounded on the east by the western line of 230KV transmission line easement for Union Electric Power Company, recorded in Book 1284,

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page 28 of the St. Clair County, Illinois recorder's office; bounded on the south by the south line of Monsanto ~~Chemical~~ Company property, ^{H/BBB} said line being parallel with and measured at right ^{P.S.} angles thereto, approximately 2000 feet southerly from the said southern line of Riverview Avenue; bounded on the west by the eastern line of an existing unimproved road running generally parallel to the aforesaid transmission line easement at an elevation varying from 418 feet to 423 feet above mean sea level between said southern line of the herein described tract and the southern line of Riverview Avenue, said tract containing approximately twenty-two (22) acres and being located approximately where shown outlined in red on Monsanto Chemical Company's drawing No. D-017-G10, dated March 31, 1959, marked Exhibit A, attached hereto and made a part hereof.

2. This lease is made subject to any and all rights or interests of third parties in or to any of said Premises. Lessor shall have the right to enter upon said Premises at all reasonable hours for the purpose of examining and inspecting the same. Lessor further reserves the right (a) to keep, maintain, operate, and renew Lessor's existing sampling wells on said Premises and to install, construct and thereafter keep, maintain, operate and renew such additional sampling wells as Lessor may desire, and (b) to keep, maintain, renew, relocate and remove Lessor's existing metal fence located on or about said Premises, and to install, construct and thereafter keep, maintain, renew, relocate and remove such additions or extensions to, or changes in, said fence as Lessor may consider necessary or convenient. Lessee agrees to cause all gates comprised in any fence, now existing or which may hereafter be erected or maintained on or about said Premises, to be closed and securely locked at all times except during such periods as Lessee shall actively be conducting operations on said Premises in accordance with said Waste Disposal Agreement.

3. Lessee agrees to maintain and use said Premises solely for the purpose of operating thereon a waste disposal area in accordance with the terms and provisions of the aforesaid Waste Disposal Agreement. Lessee expressly agrees to refrain from, as well as prevent, the disposal of any other materials, wastes or residues

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on said Premises. To the extent that there shall be no hindrance or interference, directly or indirectly, with the use of said Premises for the proper operation thereon of the disposal area in accordance with the terms of the aforesaid Waste Disposal Agreement, Lessee may use said Premises for agricultural purposes; it being expressly understood that the use of said Premises for agricultural purposes shall at all times be subject and subordinate to the use thereof as a disposal area. Lessee agrees, at Lessee's own cost and expense, to maintain said Premises in a condition satisfactory to Lessor and to provide all labor, materials, equipment, supplies and instrumentalities required in the planting, cultivating, caring for and harvesting of any crops on said Premises.

4. Lessee agrees not to use said Premises for any unlawful purpose, to comply with and observe the provisions of any law, ordinance or governmental regulation applicable to Lessee's use of said Premises, and to prevent unauthorized persons from entering on said Premises. No buildings, structures or improvements shall be installed, constructed, erected or placed on said Premises without the prior written consent of Lessor.

5. Lessee shall not be charged any rent for its use of the said Premises in accordance with the provisions hereof. All proceeds from the use of said Premises for agricultural purposes shall belong to Lessee.

MCO 0616633

6. Lessee shall defend, indemnify and hold harmless Lessor from and against any and all liability, claims, causes of action, suits, judgments, fines, penalties, losses, damages, costs and expenses of whatever kind or character arising out of, resulting from or connected with (a) Lessee's use or occupancy of or operations on said Premises for any purpose, (b) the exercise by Lessee of any of the rights or privileges granted hereby, (c) the maintenance, operation, use or existence of said Premises as a disposal area, (d) any act, omission or neglect of Lessee, its agents, representatives or employees, or

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(e) any breach by Lessee of the terms or provisions of this Lease; provided, however, the foregoing provisions of this paragraph 6 shall not apply to any injuries to person or property caused by or resulting from the negligence of the Lessor in the operation or maintenance of the Premises.

7. Lessee assumes full responsibility for, and hereby releases and discharges Lessor from any liability for, any loss or destruction of or damage to any crops or agricultural products grown or produced on said Premises unless caused by the negligence of the Lessor in the operation or maintenance of the Premises.

8. This Lease shall commence with the date first hereinabove written, and end with December 31, 1968 unless sooner terminated, as it may be at any time, by either party giving at least ninety (90) days' written notice to the other party of intention to terminate. Notwithstanding any of the foregoing, it is expressly agreed that in the event said Waste Disposal Agreement shall be cancelled, terminated or otherwise expire, this Lease shall terminate ipso facto with the cancellation, termination or other expiration of said Waste Disposal Agreement. In addition, Lessor may, without further demand or notice, terminate this Lease in the event Lessee defaults in the performance of or breaches any of its covenants, obligations or agreements under this Lease, and such default or breach shall continue for more than ten (10) days after written notice thereof shall have been given by the Lessor to Lessee.

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Upon termination howsoever of this Lease, Lessee shall peacefully deliver up and surrender possession of said Premises to Lessor, leaving the same in a neat, clean, orderly and safe condition and, provided Lessee shall have satisfied all of its liabilities to Lessor hereunder, Lessee shall remove all of Lessee's property, and, as soon as practicable, but in no event beyond the end of the growing season, Lessee's growing crops, from said Premises. In the event Lessee fails to peaceably deliver up and

surrender said Premises to Lessor as aforesaid, Lessor may, without further demand or notice, re-enter and repossess said Premises and expel Lessee and those claiming under it without being guilty of trespass and without being subject to liability for damages and without prejudice to any other remedies of the Lessor at law or in equity then existing with respect thereto.

9. Any notice of Lessor to Lessee shall be deemed served or given when posted on Premises or when deposited, postage prepaid, in the U. S. mails addressed to Lessee at its address stated above.

10. This Lease and all its provisions shall inure to or bind each party's successors and assigns; provided that none of the Premises shall be sublet and no right of Lessee shall be transferred or assigned, either voluntarily or involuntarily, without the prior written consent of Lessor. Either party hereto may waive any default at any time of the other without affecting or impairing any right arising from any subsequent default.

IN WITNESS WHEREOF, the parties hereto have duly executed this Lease as of the day and year first hereinabove written.

MONSANTO COMPANY

ATTEST:

(SEAL)

By /s/ C. E. Caspari, Jr.
Assistant Secretary

By /s/ R. M. Morris
Vice President

INDUSTRIAL SALVAGE AND DISPOSAL, INC.

ATTEST:

(SEAL)

By /s/ Paul Sauget
Secretary

By /s/ Leo Sauget
President

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STATE OF MISSOURI }
COUNTY OF ST. LOUIS } SS

I. Mary K Brady, a notary public, do hereby certify that P. M. Morris, personally known to me to be the Vice President of Monsanto Company, a Delaware corporation, and C. E. Casper, Jr. personally known to me to be the Assistant Secretary of said corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that as such Vice President and Assistant Secretary, they signed and delivered the said instrument as Vice President and Assistant Secretary of said corporation, and caused the corporate seal or said corporation to be affixed thereto, pursuant to authority given by the Board of Directors of said corporation, as their free and voluntary act, and as the free and voluntary act and deed of said corporation, for the uses and purposes therein set forth.

Given under my hand and official seal, this 30th day of November, 1964.

Commission expires May 19, 1968.

(SEAL)

/s/ Mary K. Brady

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STATE OF ILLINOIS }
COUNTY OF ST. CLAIR }

I, Mary Helen Schuchman, a notary public, do hereby certify that Leo Sauge, personally known to me to be the President of Industrial Salvage and Disposal, Inc., a Delaware corporation, and Paul Sauge personally known to me to be the Secretary of said corporation, and personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that as such President and Secretary, they signed and delivered the said instrument as President and Secretary of said corporation, and caused the corporate seal of said corporation to be affixed thereto, pursuant to authority, given by the Board of Directors of said corporation as their free and voluntary act, and as the free and voluntary act and deed of said corporation, for the uses and purposes therein set forth.

Given under my hand and official seal, this 18th day of November, 1964.

Commission expires Feb. 18-1965.

(SEAL)

Mary Helen Schuchman

MCO 0616637

WASTE DISPOSAL AGREEMENT

This Agreement made and entered into as of the first day of January, 1964, by and between MONSANTO COMPANY, a Delaware corporation, of St. Louis, Missouri, (hereinafter called "Monsanto") and INDUSTRIAL SALVAGE AND DISPOSAL, INC., a Delaware corporation, of 2902 Monsanto Avenue, Monsanto, Illinois, (hereinafter called "Industrial"),

WITNESSETH:

WHEREAS, by an Indenture of Lease of even date herewith Industrial has leased from Monsanto a tract of land of approximately twenty-two acres located near the east bank of the Mississippi River in the Village of Monsanto, Illinois, (hereinafter called the "Leased Property"); and

WHEREAS, Industrial proposes to operate on the Leased Property a sanitary landfill dump (hereinafter called the "Dump") to provide for the disposal of certain chemical waste materials of Monsanto;

NOW, THEREFORE, in consideration of the mutual covenants herein contained and for good and valuable other consideration, Monsanto and Industrial hereby agree as follows:

1. Operation of Dump. Industrial shall operate the Dump on the Leased Property in accordance with the procedures, terms and provisions set forth in the Specifications attached hereto and made a part hereof. Monsanto, at its own expense, shall arrange for the trucking of the chemical wastes from its chemical plants to the site of the Dump, and for the unloading of such wastes at the Dump. Industrial shall furnish and provide all labor and other personnel and all materials and equipment necessary for the proper operation of the Dump. Monsanto shall notify Industrial of the Monsanto employe (hereinafter called the "Engineer") who is authorized to represent Monsanto under this Agreement.

2. Removal of Drums. In connection with its operation of the Dump, Industrial has requested permission from Monsanto to remove and salvage, at Industrial's risk and expense, certain empty metal drums used to transport chemical waste materials to the Dump.

Monsanto hereby grants such permission to Industrial on the following terms and conditions:

(a) Industrial may remove from the Dump, at its own risk and expense, such number as it determines of empty metal drums that Monsanto's Engineer designates to be surplus drums, but solely for the purpose of selling the same to reputable steel scrap companies as scrap metal or to reputable salvage companies for cleaning and reclaiming. Industrial shall not sell or otherwise dispose of any of said drums to any other person, firm or corporation, and shall not remove any of said drums from the Dump for any other purpose.

(b) Any drums that are removed from the Dump by Industrial shall be removed by the end of the working day during which they are received at the Dump. Any drums not removed by Industrial pursuant to paragraph 2(a) above shall be crushed and buried by Industrial in the Dump.

(c) Industrial has been informed that the drums have been used for the storage of chemical wastes and of the possible hazards connected therewith. Industrial hereby acknowledges that it assumes responsibility for the further handling and use of the drums removed from the Dump. Industrial shall take all necessary precautions to insure that the removal and disposition of such drums, and the subsequent handling and disposition of such drums by any such steel scrap or salvage company, will not endanger the safety of, or constitute a hazard to any persons or property. Industrial further agrees to notify in writing each steel scrap or salvage company to which it may sell any of said drums of such prior use of said drums, and will attempt to obtain a similar agreement from said company that it will take necessary safety precautions and that it will warn subsequent handlers and users of the drums.

(d) Monsanto shall have the right at any time to cancel, or suspend for a specified period of time, such permission by giving at least two days' prior written notice to Industrial.

3. Price. In full payment for Industrial's entire performance of its work under this Agreement, Monsanto shall pay to Industrial each month the sum of Three Thousand Dollars (\$3,000.00).

4. Payment Procedure. Invoices for the monthly payment shall be submitted to the Engineer by Industrial on or about the first day of each month. The invoices shall be in such form and supported by such evidence as the Engineer may direct, including evidence satisfactory to the Engineer that all payrolls, materials bills and other indebtedness connected with the work under this Agreement to date have been paid. Within ten days after receipt of such invoice in proper form, Monsanto shall pay to Industrial the amount due for the preceding calendar month.

5. Safety and Miscellaneous Provisions.

(a) Industrial shall strictly comply with all safety provisions set forth in the Specifications. Industrial shall take all other necessary steps and precautions for the safe operation and maintenance of the Dump. Industrial shall cause all gates in the fences erected on the Leased Property to be closed and securely locked at all times except during such periods as Industrial shall be conducting operations at the Dump.

(b) In operating the Dump, Industrial shall observe and comply with all applicable Federal, State and local laws and regulations.

(c) In operating the Dump and performing its work under this Agreement, Industrial shall be an independent contractor and shall have complete control of all of its employees and operations. All personnel employed by Industrial shall be employees of Industrial and not of Monsanto, and Monsanto shall have no right to direct or supervise such personnel.

(d) Monsanto and Industrial agree that, in the event of changes in the wage rates of Industrial's personnel or the premature need for replacement of Industrial's equipment employed on the work under this Agreement, either party shall have the right to renegotiate the Price specified herein on the

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anniversary date of this Agreement by giving to the other party at least thirty days prior written notice of its desire to renegotiate.

6. Indemnity Provisions. Industrial shall defend, indemnify and hold harmless Monsanto from and against any and all liability, claims, causes of action, suits, judgments, fines, penalties, losses, damages, costs and expenses of whatever kind or character arising out of injuries to or the death of any person or damage to or destruction of any property, caused by or resulting from or connected with (a) the maintenance or operation of the Dump unless caused by the sole negligence of Monsanto, or (b) the removal or disposition by Industrial of drums from the Dump or other activities of Industrial pursuant to this Agreement.

7. Insurance by Industrial. Industrial shall take out and maintain, during the term of this Agreement and for such period thereafter as Monsanto shall specify upon termination, the following insurance:

(a) Workmen's Compensation and Occupational Disease Insurance in an amount equal to the limit of liability and in the form prescribed by the laws of Illinois for all of Industrial's employees engaged in work in connection with the operation of the Dump and the removal and disposition of drums. To the extent that any such employees are not protected by such a statute, Industrial shall also provide Employer's Liability Insurance in an amount not less than \$100,000 for injury to, or for the death of, any one employee, and subject to the same limitation for each employee, in an amount not less than \$300,000 on account of any one accident.

(b) Public Liability Insurance covering claims for injuries to or death of persons or damage to or destruction of property arising from the maintenance or operation of said Dump or the removal and disposition by Industrial of said drums, whether such operations be by Industrial or any person directly or indirectly employed by Industrial, and covering liabilities assumed by Industrial pursuant to paragraph 6 above. The

amount of such insurance shall be not less than:

(i) \$150,000 for injury to, or for the death of, any one person; and, subject to the same limitation for each person, in an amount not less than \$500,000 on account of any one accident; and (ii) \$100,000 for damage to property on account of each accident, or \$200,000 in the aggregate in respect of damage to property.

(c) Automobile Public Liability and Property Damage Insurance covering all owned or rented automotive equipment used by Industrial in the performance of this Agreement. Such liability insurance shall be in an amount not less than \$100,000 for injury to, or for the death of, any one person, in an amount not less than \$300,000 on account of any one accident. Property damage limits with respect to such insurance shall be not less than \$50,000 for each accident.

Such insurance shall be in form satisfactory to Monsanto and Industrial shall furnish to Monsanto certificates of such insurance satisfactory to Monsanto. Each contract of insurance shall contain the following clause:

"No reduction, cancellation or expiration of the policies providing the above coverages shall become effective until ten days from the date written notice is actually given to Mr. B. B. Byrne, Purchasing Agent, Monsanto Chemical Company, Wm. G. Krummrich Plant, Monsanto, Illinois."

All policies of insurance shall be countersigned by a duly authorized and accredited agent, or agents, of the carrier residing in the State of Illinois. All insurance shall be carried with insurance companies which, in the case of mutual companies, have a surplus to policyholders in excess of one million dollars (\$1,000,000) and in the case of stock companies, which have total capital and surplus in excess of one million dollars (\$1,000,000).

8. Term and Termination. This Agreement shall commence as of the date first hereinabove written and shall expire on December 31, 1968 unless sooner terminated, as it may be at any time, by either party giving at least ninety days' written notice to the other party of its intention to terminate. A termination of this Agreement shall not relieve Industrial of its obligations as set forth in paragraphs 6 and 7 above.

9. Prior Negotiations. This Agreement and the Indenture of Lease of even date herewith sets forth the entire agreement of Monsanto and Industrial with respect to the subject matter hereof. This Agreement shall supersede the Agreement dated November 1, 1959 between Monsanto and Industrial. All prior negotiations regarding the subject matter hereof shall be deemed to be merged herein.

IN WITNESS WHEREOF, Industrial and Monsanto have each caused this Agreement to be executed by its duly authorized representative as of the day and year first above written.

MONSANTO COMPANY

By /s/ B. B. Byrne P.A. /s/ P.S.P.

INDUSTRIAL SALVAGE AND DISPOSAL, INC.

By /s/ Paul Sargent Sec.

MCO 0616644

SPECIFICATIONS

OPERATION OF

SANITARY LANDFILL DUMP

W. G. KRUMMRICH PLANT

MONSANTO COMPANY

MONSANTO, ILLINOIS

MCO 0616045

Prepared By

Functional Maintenance Department

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SECTION A

000133

Operation of Sanitary Landfill Dump

A. Scope

1. The work to be performed is the operation of a Sanitary Landfill Dump on the River Terminal property owned by Monsanto and leased to Industrial by an Indenture of Lease dated as of January 1, 1964.

B. Location

1. The dump is to be located South of Riverview Avenue and East of Monsanto's river front tank farm. This location is as shown on Drawing D-017-G10.

C. Equipment

1. Industrial shall furnish all equipment necessary for the operation of the Sanitary Landfill Dump. This includes the operation and maintenance of such equipment.

D. General Operating Instructions

1. The materials to be encountered in the operation of the dump will fall within two groups, i.e., solids and liquids. To facilitate unloading operations within the dump site, the groups shall be separated according to group and unloaded in areas designated by the Engineer.

Liquid materials shall be discharged onto levelled receiving areas approximately 30 feet wide by 120 feet long. These areas shall be enclosed on all four sides by a retaining wall of cover material. The liquid shall then be blended and compacted with sufficient cover material to produce a stable fill. The area shall then be levelled and the retaining walls adjusted to receive the next load of liquid waste.

Solids, i.e., drummed solids and granular materials, shall be deposited in the designated area, covered and compacted. Drums are to be punctured before compacting into the fill.

It shall be understood that occasional tests or trials may become necessary as new types of wastes and new methods of operations are introduced. If such tests indicate a revision in operational procedure the revision will be adopted as directed by the Engineer.

2. Cover Material. Cover and filling material will be secured from the Krummrich Plant Power Department or the fly-ash ponds south of Monsanto's present tank farm area. Material will be trucked to the dump and stored as directed by the Engineer.
3. Appearance and Scavenging: It shall be necessary to keep the dumps smooth and neat in appearance at all time. No scavenging shall be permitted except with the permission of Monsanto's Engineer.
4. Fire Protection: Hose lines shall be provided at the dump at all times. It shall be necessary to wet down the dump to control fires and dust. The hose lines shall be connected to the fire hydrants in the River Terminal Area.
5. Use of Dump: This dump shall be operated by Industrial for the sole use of Monsanto.

MCO 0616648

SECTION B

MONSANTO COMPANY

SUPPLEMENTARY CONDITIONSA. General Provisions1. Job Site Location

Monsanto Company, William G. Krummrich Plant, Monsanto, Illinois.

2. Definitions

The word "Engineer" as used throughout the Specifications means the individual employed by Monsanto and authorized by Monsanto to represent it on this work.

3. Responsibility

In all operations under the Agreement, Industrial shall respect, adhere to and comply with all local and general ordinances and laws controlling or limiting in any way actions of those engaged upon the work.

Industrial shall secure and pay for all permits and licenses required by the laws in effect at the time of the execution of the work. Industrial, however, shall notify the Engineer of his intent to secure such permit or license prior to making application to enable Monsanto to determine if such permit or license is actually required under the law.

Any person employed on the work who shall neglect to obey the regulations imposed by Monsanto or who shall be deemed to be incompetent, or shall be guilty of any disorderly conduct or shall commit any trespass on any public or private property in the vicinity of the work, shall be at once removed from the work by Industrial, when so requested by the Engineer.

Industrial shall at all times enforce strict discipline and good order among its employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

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4. Interference with Plant Operation

Industrial shall confine its activities to the areas set aside for it to do its work and shall not interfere with any of Monsanto's activities. Unless specifically authorized by the Engineer, Industrial's employees are prohibited from

entering any plant area except those areas to which they are assigned. Prohibited areas for Industrial's employees include operating departments, washrooms, maintenance shops, offices and cafeterias.

5. Cameras

Both taking of pictures and the possession of a camera in the Plant are prohibited.

6. Monsanto Equipment

Monsanto equipment will not be loaned to Industrial's employees.

B. Special Provisions

1. Storage of Material

The receipt and storage of Industrial's materials (not furnished by Monsanto) will be the responsibility of Industrial. Outdoor storage space will be available to Industrial but it will not be permitted to store material except within the areas indicated on the plans or as directed by the Engineer.

2. Telephone

Telephone service, if desired, must be arranged and paid for by Industrial.

3. Toilet Facilities

Job toilet facilities may be provided by Industrial. These facilities shall be constructed and used in a manner that will not violate any sanitary regulations or cause any inconvenience or nuisance to Monsanto or its employees. The type of toilet facilities provided by Industrial will be subject to the approval of the Engineer. No facilities are available on the River Front Property.

4. Water

Industrial will furnish suitable drinking water for its personnel. Drinking water is not available on the River Front Property.

C. Safety Provisions

All work or operations must conform with established Monsanto practices in order to insure the maximum in safety and fire precautions. Information concerning such practices in each area will be secured from the Engineer.

MCO 0616650

All safety and security regulations of Monsanto's Wm. G. Krummrich Plant shall be observed without deviation by all of Industrial's employees. Some of these regulations are listed below.

1. Smoking

Smoking is prohibited in the Plant except in designated posted smoking areas at which locations electric lighters are provided. Having possession of matches or lighters is prohibited. At the discretion of Industrial smoking time may be allowed the workmen but they shall extinguish butts in sand buckets or containers provided before leaving the smoking area.

2. Aisles and Exits

Aisles, safety showers, fire equipment, alleys, streets and exits must be kept free of obstructions.

3. Excavations; Overhead Work

Industrial shall provide all guards, barricades, lights, etc., necessary for the safety of Plant operations and personnel.

All excavations shall be barricaded each time Industrial's workmen quit for the day. Openings, ditches, etc., must be roped off and danger signs placed. Adequate danger lighting must be provided at night.

4. Traffic Rules

- a. The speed limit is 15 M.P.H.
- b. Vehicles shall stop at all stop signs.
- c. Vehicle and equipment operators shall observe all railroad crossings and switch signs and follow the instructions on them.

5. First Aid

First-aid and emergency treatment for all injuries incurred by Industrial's employees should be received at Monsanto's Dispensary. Industrial shall promptly notify the Engineer of any injury to Industrial's employees and shall assist the Engineer in filling out the Accident Report Form for the Safety Department of Monsanto.

6. Fire Protection

Industrial shall, in all of its operations, conform to all fire regulations in effect for the Wm. G. Krummrich Plant. He shall do no burning, welding, grinding or any other flame or spark-producing operation, operate equipment of any kind or proceed with any work requiring the use of the inflammable substances (such as gasoline, kerosene, paint thinners, or any liquids with closed-cup flashpoint below 110°F.) without first securing a Monsanto fire permit and complying with the conditions and instructions specified thereon. The permits required will be supplied by the Engineer.

Should a hazardous condition develop in the area, Industrial shall, at the request of any Monsanto employee, stop all cutting, welding or other spark-producing activities.

7. Fire

Industrial shall familiarize all personnel working directly or indirectly under him with the following rules to be followed in case of fire:

- a. To report a fire -- go to any plant telephone, dial Station 200 and give the designation of the building or area in which the fire is located.
- b. If the fire alarm (siren) sounds while personnel are driving in the Plant, they shall pull over to the side of the road and stop.
- c. Visiting at the scene of a fire or accident by personnel other than members of fire or emergency crews is prohibited.
- d. In case of a fire on the job site for which the Fire Department is called, all personnel other than Industrial's supervisors shall immediately leave the area. The supervisors shall keep themselves available to assist the Fire Department.

8. Industrial Hazards

Industrial shall acquaint itself with the industrial hazards, if any, to be encountered in each particular area. Information pertaining to such hazards shall be obtained through the Engineer.

MCO 0616652

9. Pipes

Process piping shall never be used either to support an individual worker or to support staging. If it becomes necessary for a ladder to be leaned against a pipe to accomplish some work, permission of the Engineer shall first be secured.

10. Wiring

No wiring should be cut without consulting the Engineer. Any wire accidentally broken should be reported immediately to the Engineer or Monsanto's Electrical Foreman.

11. Clean-Up of Job

Industrial must keep the area of its work clean and promptly remove any excess materials or equipment.

12. Use of Intoxicants

Persons judged to be under the influence of intoxicating beverages will not be admitted into the Plant. The carrying of intoxicating beverages into the Plant is prohibited. Violation of this regulation will result in immediate and permanent removal of the employee from the Plant property.

13. Railroad Clearances

When it is necessary to work adjacent to a switch track, care must be taken that equipment and material do not encroach on the clearance area required by law. This is 8'6" on both sides of the track. Overhead clearance is 22'6" above top of the rail. All equipment and materials must be removed from these clearances at the end of each work day unless arrangements have been made to the contrary.

MCO 0616653

000150

SECTION CDrawing List

The following drawing has been prepared by the Organic Chemicals Division of the Monsanto Company:

<u>DWG.</u>	<u>REV.</u>	<u>DATE</u>	<u>TITLE</u>
D-017-G10	0	3/31/59	River Terminal Sanitary Landfill Dump

MCO 0616654

Monsanto

FROM (NAME & LOCATION) R. A. Miller - JFQ/WGK Purchasing

DATE March 6, 1973

cc W. C. Petty - JFQ

SUBJECT CONTRACT NO. 3-565
1973 LIQUID WASTE DISPOSAL
REFERENCE SAUGET AND COMPANY

000141

TO : MESSRS:

B. B. Byrne	- JFQ
T. W. Dalton	- WGK
C. N. Deubner	- WGK
M. R. Foresman	- WGK
P. F. Gatens	- JFQ
J. F. Hart	- WGK
P. E. Heisler	- WGK
C. P. Ladenberger	- JFQ
D. C. Malm	- JFQ
R. G. Moody	- WGK
A. E. Peterson	- JFQ
H. G. Rayfield	- WGK
M. T. Schade	- JFQ
M. J. Smid	- JFQ
L. W. Sprandel	- WGK
G. W. Watson	- WGK
R. L. Wiese	- JFQ
B. R. Williams	- WGK

Enclosed is a copy of our 1973-75 three year "toxic dump" contract with Sauget and Company. 1972 pricing of \$4,100 per month (\$2460 for WGK and \$1640 for JFQ) remains in effect. If you have any comments or questions, please call me.

Dick
R. A. Miller

/rs

Encls.

K + ~~Q~~ E

#14
A

II

Site R
#1

MCO 0616655

Disposal of disposal
Contract

K00031

Monsanto

MONSANTO INDUSTRIAL CHEMICALS CO.
800 N. Lindbergh Boulevard
St. Louis, Missouri 63186
Phone: (314) 894-1000

000142

December 29, 1972

Sauget & Company
2700 Monsanto Avenue
Sauget, Illinois

RE: EXTENSION OF LEASE

Gentlemen:

Reference is hereby made to that certain Lease dated January 1, 1970, with a term of three years, between Monsanto Company as Lessor and Sauget & Company as Lessee by which Monsanto leased certain lands situated in the Village of Sauget, County of St. Clair, State of Illinois, bounded on the North by Riverview Avenue; on the East by a 230 KV transmission line of Union Electric Company; on the South by other land of Monsanto and on the West by an existing unimproved road, containing approximately 22 acres and more particularly described in said Lease.

This letter will serve to indicate our agreement to extend the term of the above mentioned Lease for an additional period of three years, expiring on December 31, 1975.

All the other terms, conditions and provisions contained in said Lease shall continue in full force and effect during all of said extended term, unless sooner terminated as provided in paragraph 7 of said Lease.

If this letter properly expresses our agreement with respect to the extension of said Lease, please so indicate by

MCO 0616656

a unit of Monsanto Company

K00032

Sauget & Company

- 2 -

December 29, 1972

000143

signing on the line provided below and by returning a copy
to the writer.

Yours very truly,

MONSANTO COMPANY

BY  *ps*

Extension Accepted and
Agreed to as of
December 29, 1972:

SAUGET & COMPANY

BY _____

MCO 0616657

K00033

000144

AGREEMENT

between

MONSANTO COMPANY

and

SAUGET AND COMPANY

DATED

January 1, 1973

for

Sanitary Landfill

W. G. Krummrich Plant

Sauget, Illinois

MCD 0616658

K00034

WASTE DISPOSAL AGREEMENT

000145

This Agreement made and entered into as of the first day of January, 1973, by and between MONSANTO COMPANY, a Delaware corporation, of St. Louis, Missouri (hereinafter called "Monsanto"), and SAUGET AND COMPANY, a Delaware corporation, of 2700 Monsanto Avenue, Sauget, Illinois (hereinafter called "Sauget"),

WITNESSETH:

WHEREAS, by an Indenture of Lease dated January 1, 1970, extended by letter agreement dated December 29, 1972, Sauget has leased from Monsanto a tract of land of approximately twenty-two acres located near the east bank of the Mississippi River in the Village of Sauget, Illinois (hereinafter called the "Leased Property"); and

WHEREAS, Sauget proposes to operate on the Leased Property a sanitary landfill (hereinafter called the "Landfill") to provide for the disposal of certain chemical waste materials of Monsanto;

NOW, THEREFORE, in consideration of the mutual covenants herein contained and for good and valuable other consideration, Monsanto and Sauget hereby agree as follows:

MCO 0616659

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1. Operation of Landfill. Sauget shall operate the Landfill on the Leased Property in accordance with the procedures, terms and provisions set forth in the Specifications attached hereto and made a part hereof. Monsanto, at its own expense, shall arrange for the trucking of the chemical wastes from its chemical plants to the site of the Landfill, and for the unloading of such wastes at the Landfill. In disposing of material in said Landfill, Monsanto and all third parties employed by it for such purposes shall comply with all provisions of this Agreement. In the event of any breach of such provisions by any third party, Sauget shall notify Monsanto which shall not thereafter use or employ such third party. Sauget shall furnish and provide all labor and other personnel and all materials and equipment necessary for the proper operation of the Landfill. Monsanto shall notify Sauget of the Monsanto employee (hereinafter called the "Engineer") who is authorized to represent Monsanto under this Agreement.

2. Scavenging Forbidden. Under no circumstances shall any materials or containers which have been delivered to the Landfill by Monsanto for disposal be scavenged or retrieved for reuse or resale. Sauget covenants that it will use its best efforts to assure that this prohibition is reasonably implemented.

3. Price. In full payment for Sauget's entire performance of its work under this Agreement, Monsanto shall pay to Sauget each month the sum of Four Thousand One Hundred Dollars (\$4,100.00).

MCO 0616660

K00036

4. Payment Procedure. Invoices for the monthly payment shall be submitted to the Engineer by Sauget on or about the first day of each month. The invoices shall be in such form and supported by such evidence as the Engineer may direct, including evidence satisfactory to the Engineer that all payrolls, materials bills and other indebtedness connected with the work under this Agreement to date have been paid. Within twenty days after receipt of such invoice in proper form, Monsanto shall pay to Sauget the amount due for the preceding calendar month.

5. Safety and Miscellaneous Provisions.

(a) Sauget shall strictly comply with all safety provisions set forth in the Specifications. Sauget shall take all other necessary steps and precautions for the safe operation and maintenance of the Landfill. Sauget shall cause all gates in the fences erected on the Leased Property to be closed and securely locked at all times except during such periods as Sauget shall be conducting operations at the Landfill. During the periods in which the gates and fences are unlocked for the conducting of landfill operations, Sauget personnel shall allow entry only to Monsanto personnel and properly authorized third parties.

(b) In operating the Landfill, Sauget shall observe and comply with all applicable Federal, State and local laws and regulations.

MCO 0616661

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(c) In operating the Landfill and performing its work under this Agreement, Sauget shall be an independent contractor and shall have complete control of all of its employees and operations. All personnel employed by Sauget shall be employees of Sauget and not of Monsanto, and Monsanto shall have no right to direct or supervise such personnel.

(d) Monsanto and Sauget agree that, in the event of changes in the wage rates of Sauget's personnel or the premature need for replacement of Sauget's equipment employed on the work under this Agreement, either party shall have the right to renegotiate the Price specified herein on the anniversary date of this Agreement by giving to the other party at least thirty days' prior written notice of its desire to renegotiate.

6. Indemnity Provisions. Sauget shall defend, indemnify and hold harmless Monsanto from and against any and all liability, claims, causes of action, suits, judgments, fines, penalties, losses, damages, costs and expenses of whatever kind or character arising out of injuries to or the death of any person or damage to or destruction of any property, caused by or resulting from or connected with (a) the maintenance or operation of the Landfill unless caused by the sole negligence of Monsanto, or (b) other activities of Sauget pursuant to this Agreement.

MCO 0616662

K00038

7. Insurance by Sauget. Sauget shall take out and maintain during the term of this Agreement and for such period thereafter as Monsanto shall specify upon termination, the following insurance:

(a) Workmen's Compensation and Occupational Disease Insurance in an amount equal to the limit of liability and in the form prescribed by the laws of Illinois for all of Sauget's employees engaged in work in connection with the operation of the Landfill. To the extent that any such employees are not protected by such a statute, Sauget shall also provide Employer's Liability Insurance in an amount not less than \$500,000 for bodily injury by accident or disease, including death at any time resulting therefrom.

(b) Public Liability Insurance covering claims for injuries to or death of persons or damage to or destruction of property arising from the maintenance or operation of said Landfill, whether such operations be by Sauget or any person directly or indirectly employed by Sauget, and covering liabilities assumed by Sauget pursuant to paragraph 6 above. The amount of such insurance shall be not less than: (i) \$200,000 for injury to, or for the death of, any one person; and, subject to the same limitation for each person, in an amount not less than \$1,000,000 on account of any one occurrence; and (ii) \$200,000 for damage to property on account of each accident.

MCO 0616663

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-6-

(c) Automobile Public Liability and Property Damage Insurance covering all owned or rented automotive equipment used by Sauget in the performance of this Agreement. Such liability insurance shall be in an amount not less than \$200,000 for injury to, or for the death of, any one person, in an amount not less than \$500,000 on account of any one accident. Property damage limits with respect to such insurance shall be not less than \$50,000 for each accident.

Such insurance shall be in a form satisfactory to Monsanto and Sauget shall furnish to Monsanto certificates of such insurance satisfactory to Monsanto. Each contract of insurance shall contain the following clause:

"No reduction, cancellation or expiration of the policies providing the above coverages shall become effective until ten days from the date written notice is actually given to Mr. R. A. Miller, Purchasing Supervisor, Monsanto Company, W. G. Krummrich Plant, Sauget, Illinois."

All policies of insurance shall be countersigned by a duly authorized and accredited agent, or agents, of the carrier residing in the State of Illinois. All insurance shall be carried with insurance companies which, in the case of mutual companies, have a surplus to policyholders in excess of one million dollars (\$1,000,000) and in the case of stock companies, which have total capital and surplus in excess of one million dollars (\$1,000,000).

MCD 0616664

8. Term and Termination. This Agreement shall commence on January 1, 1973 and shall expire on December 31, 1975 unless sooner terminated. This Agreement may be terminated at any time for any reason by either party giving at least thirty days' written notice to the other party of its intention to terminate. A termination of this Agreement shall not relieve Sauget of its obligations as set forth in paragraphs 6 and 7 above.

9. Prior Negotiations. This Agreement and the Indenture of Lease of even date herewith sets forth the entire agreement of Monsanto and Sauget with respect to the subject matter hereof. This Agreement shall supersede the Agreement dated January 1, 1970 between Monsanto and Sauget and Company. All prior negotiations regarding the subject matter hereof shall be deemed to be merged herein.

IN WITNESS WHEREOF, Sauget and Monsanto have each caused this Agreement to be executed by its duly authorized representative as of the day and year first above written.

MONSANTO COMPANY

By R. A. Miller psl

SAUGET AND COMPANY

By Paul Sauget

MCO 0616665

SPECIFICATIONS

OPERATION OF
SANITARY LANDFILL
W. G. KRUMMRICH PLANT
MONSANTO COMPANY
SAUGET, ILLINOIS

dated
January 1, 1973

MCO 0616666

TABLE OF CONTENTSTITLE

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Table of Contents	-1-
Section A - Operation of Sanitary Landfill	A-1 thru A-2
Section B - Supplementary Conditions	B-1 thru B-4
Section C - Drawing List	C-1

MCO 0616667

SECTION AOperation of Sanitary Landfill1.0 Scope

1.1 The work to be performed is the operation of a Sanitary Landfill on the River Terminal property owned by Monsanto and leased to Sauget by an Indenture of Lease dated as of January 1, 1973.

2.0 Location

2.1 The Landfill is to be located South of Riverview Avenue and East of Monsanto's river front tank farm. This location is as shown on Drawing D-179-G1.

3.0 Equipment

3.1 Sauget shall furnish all equipment necessary for the operation of the Sanitary Landfill. This includes the operation and maintenance of such equipment.

4.0 General Operating Instructions

4.1 The materials to be encountered in the operation of the Landfill will fall within two groups, i.e., solids and liquids. To facilitate unloading operations within the fill site, the groups shall be separated according to group and unloaded in areas designated by the Engineer.

4.2 Liquid materials shall be discharged onto leveled receiving areas approximately 30 feet wide by 120 feet long. These areas shall be enclosed on all four sides by a retaining wall of cover material. The liquid shall then be blended and compacted with sufficient cover material to produce a stable fill. The area shall then be leveled and the retaining walls adjusted to receive the next load of liquid waste.

4.3 Solids, i.e., drummed solids and granular materials, shall be deposited in the designated area, covered and compacted. Drums are to be punctured before compacting into the fill.

4.4 It shall be understood that occasional tests or trials may become necessary as new types of wastes and new methods of operations are introduced. If such tests indicate a revision in operational procedure, the revision will be adopted as directed by the Engineer.

MCO 0616668

4.5 Cover Material. Cover and filling material will be secured from the Krumirich Plant Power Department, Monsanto's J. F. Queeny Plant Power Department or the fly-ash ponds south of Monsanto's present tank farm area. Material will be trucked to the Landfill and stored as directed by the Engineer.

4.6 Appearance and Scavenging. It shall be necessary to keep the Landfill smooth and neat in appearance at all times. No scavenging shall be permitted.

4.7 Fire Protection. Hose lines shall be provided at the Landfill at all times. It shall be necessary to wet down the Landfill to control fires and dust. The hose lines shall be connected to the fire hydrants in the River Terminal Area. During the first year of this Agreement Monsanto will install a temporary water line along the fence line at the west side of the Leased Property to connect to two fire hydrants at the Landfill.

4.8 Use of Landfill. This Landfill shall be operated by Sauget for the sole use of Monsanto.

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SECTION B

MONSANTO COMPANY

SUPPLEMENTARY CONDITIONS1.0 Job Site Location

1.1 Monsanto Company, William G. Krummrich Plant, Sauget, Illinois.

2.0 Definitions

2.1 The word "Engineer" as used throughout the Specifications means the individual employed by Monsanto and authorized by Monsanto to represent it on this work.

3.0 Responsibility

3.1 In all operations under the Agreement, Sauget shall respect, adhere to and comply with all local and general ordinances and laws controlling or limiting in any way actions of those engaged upon the work.

3.2 Sauget shall secure and pay for all permits and licenses required by the laws in effect at the time of the execution of the work. Sauget, however, shall notify the Engineer of its intent to secure such permit or license prior to making application to enable Monsanto to determine if such permit or license is actually required under the law.

3.3 Any person employed on the work who shall neglect to obey the regulations imposed by Monsanto or who shall be deemed to be incompetent, or shall be guilty of any disorderly conduct or shall commit any trespass on any public or private property in the vicinity of the work, shall be at once removed from the work by Sauget, when so requested by the Engineer.

3.4 Sauget shall at all times enforce strict discipline and good order among its employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

4.0 Interference with Plant Operation

4.1 Sauget shall confine its activities to the areas set aside for it to do its work and shall not interfere with any of Monsanto's activities. Unless specifically authorized by the Engineer, Sauget's employees are prohibited from entering any plant area except those areas to which they are assigned. Prohibited areas for Sauget's employees include operating departments, washrooms, maintenance shops, offices and cafeterias.

5.0 Cameras

5.1 Both taking of pictures and the possession of a camera in the Plant are prohibited.

6.0 Monsanto Equipment

6.1 Monsanto equipment will not be loaned to Sauget's employees.

7.0 Storage of Material

7.1 The receipt and storage of Sauget's materials (not furnished by Monsanto) will be the responsibility of Sauget. Outdoor storage space will be available to Sauget but it will not be permitted to store material except within the areas indicated on the plans or as directed by the Engineer.

8.0 Telephone

8.1 Telephone service, if desired, must be arranged and paid for by Sauget.

9.0 Toilet Facilities

9.1 Job toilet facilities may be provided by Sauget. These facilities shall be constructed and used in a manner that will not violate any sanitary regulations or cause any inconvenience or nuisance to Monsanto or its employees. The type of toilet facilities provided by Sauget will be subject to the approval of the Engineer. No facilities are available on the River Front Property.

10.0 Water

10.1 Sauget will furnish suitable drinking water for its personnel. Drinking water is not available on the River Front Property.

11.0 Safety

11.1 Sauget shall have read and shall be familiar with the Occupational Safety and Health Act of 1970, as amended, and shall comply fully with all applicable regulations therein during and with respect to its entire performance of this Agreement.

11.2 All work or operations must conform with established Monsanto practices in order to insure the maximum in safety and fire precautions. Information concerning such practices in each area will be secured from the Engineer.

11.3 All safety and security regulations of Monsanto's Wm. G. Krummrich Plant shall be observed without deviation by all of Sauget's employees. Some of these regulations are listed below.

12.0 Smoking

12.1 Smoking is prohibited in the Plant except in designated posted smoking areas at which locations electric lighters are provided. Having possession of matches or lighters is prohibited. At the discretion of Sauget smoking time may be allowed the workmen but they shall extinguish butts in sand buckets or containers provided before leaving the smoking area.

13.0 Aisles and Exits

13.1 Aisles, safety showers, fire equipment, alleys, streets and exits must be kept free of obstructions.

14.0 Excavations; Overhead Work

14.1 Sauget shall provide all guards, barricades, lights, etc., necessary for the safety of Plant operations and personnel.

14.2 All excavations shall be barricaded each time Sauget's workmen quit for the day. Openings, ditches, etc., must be roped off and danger signs placed. Adequate danger lighting must be provided at night.

15.0 Traffic Rules

15.1 The speed limit is 15 M.P.H.

15.2 Vehicles shall stop at all stop signs.

15.3 Vehicle and equipment operators shall observe all railroad crossings and switch signs and follow the instructions on them.

16.0 First Aid

16.1 First aid and emergency treatment for all injuries incurred by Sauget's employes should be received at Monsanto's Dispensary. Sauget shall promptly notify the Engineer of any injury to Sauget's employes and shall assist the Engineer in filling out the Accident Report Form for the Safety Department of Monsanto.

17.0 Fire Protection

17.1 Sauget shall, in all of its operations, conform to all fire regulations in effect for the Wm. G. Krummrich Plant. It shall do no burning, welding, grinding or any other flame or spark-producing operation, operate equipment of any kind or proceed with any work requiring the use of the inflammable substances (such as gasoline, kerosene, paint thinners, or any liquids with closed-cup flashpoint below 110°F.) without first securing a Monsanto fire permit and complying with the conditions and instructions specified thereon. The permits required will be supplied by the Engineer.

MCO 0616672

17.2 Should a hazardous condition develop in the area, Sauget shall, at the request of any Monsanto employee, stop all cutting, welding or other spark-producing activities.

18.0 Fire

18.1 Sauget shall familiarize all personnel working directly or indirectly for it with the following rules to be followed in case of fire:

18.1.1 To report a fire - go to any plant telephone, dial Station 2000 and give the designation of the building or area in which the fire is located.

18.1.2 If the fire alarm (siren) sounds while personnel are driving in the Plant, they shall pull over to the side of the road and stop.

18.1.3 Visiting at the scene of a fire or accident by personnel other than members of fire or emergency crews is prohibited.

18.1.4 In case of a fire on the job site for which the Fire Department is called, all personnel other than Sauget's supervisors shall immediately leave the area. The supervisors shall keep themselves available to assist the Fire Department.

19.0 Industrial Hazards

19.1 Sauget shall acquaint itself with the industrial hazards, if any, to be encountered in each particular area. Information pertaining to such hazards shall be obtained through the Engineer.

20.0 Pipes

20.1 Process piping shall never be used either to support an individual worker or to support staging. If it becomes necessary for a ladder to be leaned against a pipe to accomplish some work, permission of the Engineer shall first be secured.

21.0 Wiring

21.1 No wiring should be cut without consulting the Engineer. Any wire accidentally broken should be reported immediately to the Engineer or Monsanto's Electrical Foreman.

22.0 Clean-up of Job

22.1 Sauget must keep the area of its work clean and promptly remove any excess materials or equipment.

MCO 0616673

23.0 Use of Intoxicants

23.1 Persons judged to be under the influence of intoxicating beverages will not be admitted into the Plant. The carrying of intoxicating beverages into the Plant is prohibited. Violation of this regulation will result in immediate and permanent removal of the employee from the Plant property.

24.0 Railroad Clearances

24.1 When it is necessary to work adjacent to a switch track, care must be taken that equipment and material do not encroach on the clearance area required by law. This is 8'6" on both sides of the track. Overhead clearance is 22'6" above top of the rail. All equipment and materials must be removed from these clearances at the end of each work day unless arrangements have been made to the contrary.

MCO 0616674

SECTION CDrawing List

The following drawing has been prepared by Monsanto Industrial Chemicals Company, an operating unit of the Monsanto Company:

<u>DRAWING</u>	<u>REV.</u>	<u>DATE</u>	<u>TITLE</u>
D-179-G1	1	12/15/69	River Terminal Property Topographic Survey for Proposed Waste Dump

MCO 0616675

MONSANTO CHEMICAL COMPANY

Inter-Office Correspondence

FROM LOCATION : WOK

cc: R. J. Stratmeyer
R. W. Kraft
C. N. Stutz

DATE : September 2, 1960

SUBJECT : Sanitary Landfill
Operating Supervision

REFERENCE :

000162

TO : G. W. Hamilton

The first part of August we agreed that you would take over the Operating Supervision of the Sanitary Landfill early in September. Please, let us know your selection of supervision and date we can start training.

The attached "Procedure for Operating Sanitary Landfill" and personal instruction from Ron Kraft should be adequate training for the person whom you may select. After your man is trained, Ron will give operational advise as needed from time to time.


L. W. Sprandel

/ls

Att: 4 copies - Procedure for Operating
Sanitary Landfill

~~the specific~~
Nonspecific (K+E)^{#15} A

II

Site R

#1

MCO 0616676

Guidelines for operating

**PROCEDURE FOR OPERATING
SANITARY LANDFILL**

**WM. G. KRUMMRICH PLANT
MONSANTO CHEMICAL COMPANY
MONSANTO, ILLINOIS**

MCO 0616677

**Prepared By
Plant Improvement and Engineering Dept.
August 1960**

K00053

PROCEDURE FOR OPERATING SANITARY LANDFILLPurpose:

The purpose of this procedure is to give Monsanto's supervision the basic ideas behind the running of the Sanitary Landfill. These ideas are based on past experience obtained by the Plant Improvement Engineering Department of The Wm. G. Krummrich Plant.

The purpose of the Sanitary Landfill is to furnish to the Wm. G. Krummrich Plant, the J. F. Queeny Plant and to the General Offices a safe place to dispose of their toxic waste materials. At the same time, we will run this dump in orderly and neat manner so the area may be reclaimed for future expansion as the Landfill becomes filled.

Operating Instructions:

The waste materials encountered in the operation of the dump will fall into two categories, i.e., solids and liquids.

Liquid Materials:

Liquid materials are disposed of in soaking ponds 125 feet by 30 feet. These ponds are constructed as level as possible to give a uniform depth of liquid waste. The ponds are enclosed on all four sides by a retaining wall of fill material.

The liquid is discharged into the pond, allowed to cool and crystallize, then blended and compacted with sufficient fill material to produce a stable fill.

The average liquid waste requires a ratio of 3:1 to 5:1 fill to waste. However, if the liquid crystallizes then a ratio of only 1:1 is required.

An intermingling of liquid waste has been necessary during the operation of the Landfill. These intermingled wastes exhibit little or no crystallizing properties. Therefore, materials should not be mixed indiscriminately.

After the waste is blended with fill and compacted the area is levelled and the retaining walls adjusted to receive the next load of liquid waste.

Four or five ponds should be in operation at all times. The ponds should be accessible on at least two sides preferably three. This will allow the drivers to discharge the waste chemicals without danger of the wind blowing toxic fumes back on them.

MCO 0616678

The Landfill should be planned to be filled from the northwest corner to the southwest corner, i.e., the area on the northwest corner should be filled in first. This will allow rain water to run off of the landfill and will enable the northwest corner to be used for expansion first. However, this does not mean to just fill the northwest corner and leave the rest of the dump at its present level. The rest of the dump should be filled but it should remain at a lower elevation than the northwest corner.

Solid Material:

Solid material, i.e., drummed solids and granular materials should be deposited in the designated area, covered and compacted. Granular material can be deposited in the same manner and area as the liquid material. Drummed solids should be deposited in an area away from the current liquid operation. The drums should be arranged to save space and deliver maximum ground area without stacking. They are then perforated, crushed by walking on them with the tractor, and then covered with fill material. In some cases the tractor operator should wear safety glasses and face shield when performing this operation. If the drums are not perforated they will be more difficult to crush and present a hazard to the tractor operator. (They may break and splash liquid on him.)

Fill Material:

The fill material presently being used is cinders from the Wm G. Krummrich powerhouse. In the past, flyash from the Union Electric flyash ponds, south of the Landfill, was tried. This flyash has been deemed unsuitable because of its poor absorption and compaction qualities. It requires 50% more flyash to approach the WGC cinders. To use flyash at this time would require a hauling problem. It would require approximately four hours per day of tractor time to dig and load flyash to be used as fill. This would allow the tractor operator only one-half the present time to build and fill soaking beds. Another factor in using flyash is it would produce a dust problem because of its small particle size. However, this could be overcome by wetting the flyash.

Special Handling:

The following materials have to have special handling:

ONCB - Orthonitrochlorobenzene - This material is extremely toxic. During the winter months it is delivered in tank trucks, poured into ponds and allowed to crystallize. It should not be blended with fill until it is crystallized. During the summer months this material will not crystallize. It must either be stored or delivered to the dump in drums. When delivered in drums it must be solid. If the drums are buried immediately the ONCB will remain solid and no problems arise.

MCO 0616679

K00055

Phosphorous - This material burns upon contact with air. The fumes are toxic. Phosphorous must be buried outside of the fenced area. If buried inside of the fenced area it may ignite the other materials deposited in the dump. There is no danger as long as the phosphorous remains covered, however, if it becomes uncovered at a later date it will ignite.

Waste from Dept. 262 - This material is unusually difficult to blend. It requires ratios of 15:1 to 20:1 to blend, even then the fill lacks an acceptable soil bearing condition. Presently, this condition is being corrected by the Department and in the future this material should be easier to handle.

P₂S₅ - This material should be disposed of outside of the fenced area. It should be dumped and then buried. This material will decompose in about one year and will not cause any future problems.

Other Materials - Other materials both from the Krummrich Plant and the Queeny Plant are handled on routine basis. The tractor operator should direct the disposing of these waste. On occasion some materials coming from the General Office requires special handling. However, before these materials arrive someone from the department sending them will inform you how to dispose of this material and what special precautions should be taken.

Test Wells:

There are five test wells located around the landfill. These wells are used to determine if the underground water is being contaminated by percolation of ground water through the overburden. These wells should be sounded and tested on a monthly basis. In the future, we may reduce this requirement to a three month period.

The wells are sounded by lowering the end of a M-Scope into the well until a current is indicated on the amp meter. The depth of the well water can then be determined by reading the depth off of the cord which was lowered into the well. There are two M-Scopes located in the office of the power house.

The well water is tested by lowering a "thief" into the well and bringing up a sample of water. One 1/2 gal. bottle of water is enough of a sample from each well. The sample should be taken to the laboratory and tested for COD, Sulfates, PH, Dissolved Iron, Extractable Organics, Chlorides, and Phenol.

The results of these tests should be forwarded to the Plant Improvement and Engineering Dept.

Contractor:

MCO 0616680

The physical operation of the Landfill is contracted to Industrial Salvage and Disposal Corporation. Contact Paul Sauget Bridge 1-4839.

Payment:

Industrial is paid monthly on the following basis:

- a. Wages of field personnel employed by Industrial at rates not higher than the standard being paid in the locality.

K00056

- b. Materials, supplies, and hand tools consumed by Industrial in operating the Landfill.
- c. A fixed payment of \$445.25 per month to amortize Industrial's cost in purchasing a tractor and dump truck.
- d. The cost of operating and maintaining the tractor and dump truck used by Industrial in operating the Landfill.
- e. Premiums on insurance policies required by the waste disposal agreement.
- f. Other cost and expenses incurred by Industrial with prior written approval of Monsanto's supervision.
- g. A fee of 15% on all of the above expenses except Item c.

Processing Payment:

The monthly statement from Industrial will be submitted to Monsanto on or about the third Friday of each month. This statement will show the fixed payment and the reimbursable costs. In addition to this statement Industrial shall furnish supporting invoices and payroll records. This statement should be processed as soon as possible using the following outline:

- a. Check Industrials' statement to make sure it is free of errors so payment can be made as soon as possible.
- b. Charge 57% of the bill to account 2-03-907.27-804 (Wm. G. Krummrich Plant.)
- c. Charge 2% of the bill to the General Office account 1-00-605.0453.
- d. The other 41% is allocated to several different J. F. Queeny accounts. The breakdown of this 41% is supplied by Mr. Miner of the Queeny Plant. The account number is 2-01-xxx.xx-847. The five x's are supplied by Mr. Miner.

This information will be printed on the front of Industrial's statement and given to the purchasing department.

Non-Toxic Wastes:

Non-toxic wastes are not deposited in the Sanitary Landfill. They are dumped in Leo Sauget's dump. The Landfill is reserved only for toxic and liquid materials.

Estimated Life:

MCO 0616681

Estimated life of the Landfill is between seven and ten years. With the present amount of waste, the Landfill should last about nine years. The Landfill is situated on a 22-acre track and has a usable volume of 405,000 cubic yards to fill.

Conclusion:

The Landfill is just getting out of the experimental stages where it can be a self-sustaining operation. There may be from time to time a need for some changes in the method of operation as outlined herein.

However, this procedure will be followed exactly unless specific instructions are given by the Plant Improvement and Engineering Department. No other agency either within the Krumrich Plant or outside of this plant will be followed without prior approval of the Plant Improvement and Engineering Department.

Ronald W. Kraft

/ls

MCO 0616682

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OPERATIONS MANUALCHEMICAL WASTE DISPOSAL AND USE OF THE KRUMMRICH PLANT
CHEMICAL WASTE LANDFILLI. PURPOSE

This procedure establishes control measures for the safe and environmentally acceptable disposal of chemical process waste materials. It is also intended to insure that such disposal methods are consistent with all applicable state and federal environmental protection agency regulations.

II. POLICY

The Krummrich Plant chemical waste landfill is to be used for the safe and efficient disposal of various approved non-hazardous, solid form, Monsanto generated, chemical wastes as allowed by Illinois and Federal E.P.A. regulations. Other chemical residues are to be disposed of by incineration at the Krummrich Plant liquid waste incinerator or by an approved waste disposal contractor. Illinois regulations limit landfill disposal to Monsanto owned chemicals on Monsanto owned land.

III. SCOPE

All Monsanto locations utilizing the Krummrich Plant chemical landfill are covered by this procedure. This procedure does not cover operation of the Village of Sauget trash landfill.

IV. RESPONSIBILITIESA. GENERAL SUPERINTENDENT - DISTRIBUTION AND SERVICES - KRUMMRICH PLANT

Responsible for all phases of the physical disposal of chemical wastes in the landfill. Specifically, these responsibilities include:

1. The health and safety of Monsanto personnel while within the landfill.
2. The administration of expenses incurred in operating the landfill.
3. The most economical use of the available area.

MCO 0616683

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IV. RESPONSIBILITIES (Cont'd)A. GENERAL SUPERINTENDENT - DISTRIBUTION AND SERVICES -
KRUMMRICH PLANT (Cont'd)

4. Insuring that only approved Monsanto generated chemical wastes are disposed of in the landfill.
5. The evaluation of future requirements, life of present operation, future actions in acquisition of land, rental, etc.
6. Hauling of drummed materials to landfill.

In addition, the General Superintendent of Distribution and Services will have responsibility for specifying proper labeling, shipping container and mode of shipment for all chemical wastes being shipped to a waste disposal contractor.

B. GENERAL SUPERINTENDENT OF MAINTENANCE

1. Responsible for hauling of solid form wastes to landfill and administration of cost of same.

C. APPROPRIATE PRODUCTION GENERAL SUPERINTENDENT -
KRUMMRICH PLANT

1. Responsible for surveying new and existing chemical processes and reporting volumes of chemical waste materials expected per week, month and year.
2. Responsible for identifying and reporting any significant change in the type or volume of waste materials, as well as any new waste materials generated.

D. GENERAL SUPERINTENDENT TECHNICAL SERVICES - KRUMMRICH
PLANT, OR OTHER DESIGN RESPONSIBILITY

RESPONSIBILITIES:

MCO 0616685

1. Survey existing facilities and take appropriate actions to minimize the amounts of waste materials generated.
2. Survey new chemical processes during the design and evaluation stage. Take the necessary actions to insure that the amount of waste products generated will be minimized and to make certain that the design of the plant includes facilities to handle chemical wastes according to plant practice and capabilities.

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IV. RESPONSIBILITIES (Cont'd)D. GENERAL SUPERINTENDENT TECHNICAL SERVICES - KRUMMRICH PLANT, OR OTHER DESIGN RESPONSIBILITY (Cont'd)

3. Provide assistance in determination of physical properties and chemical characteristics of chemical waste materials.

E. W. G. KRUMMRICH PLANT ENVIRONMENTAL CONTROL GROUP - WASTE DISPOSAL SPECIALIST

RESPONSIBILITIES:

1. Interpretation of data on toxicity and physical and chemical characteristics of waste materials.
2. Initiation of actions and studies to obtain additional information as required, such as toxicity screening, leachate studies, etc.
3. Maintenance of contacts with disposal contractors to ascertain their ability to dispose of a given waste product.
4. Determination of proper and acceptable disposal method.
5. Notification of appropriate personnel of the expected aspects of other wastes in the landfill together with special precautions needed for their disposal.
6. Obtaining of necessary approvals from Monsanto Corporate, Medical, legal, and M.I.C.C. Environmental control support groups.
7. Preparation and handling of all correspondence with Environmental Control Regulatory Agencies.
8. Collection of water samples periodically from observation wells around the landfill and have them analyzed for possible contaminants.

F. OTHER MONSANTO FACILITIES

MCO 0616686

These installations are responsible for appointing liaison personnel. Such personnel will initiate requests for permission to utilize the Krummrich plant chemical landfill. Additionally, he is responsible for:

1. Providing such information and samples as are requested by the Krummrich Plant Waste Specialist.

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IV. RESPONSIBILITIES (Cont'd)

000172

F. OTHER MONSANTO FACILITIES (Cont'd)

2. Arranging for transportation of such wastes to the landfill and responsible for the cost of same.
3. Arranging for payment of an appropriate share of the expenses incurred in the operation of the landfill.

V. PROCEDURE

- A. The Production General Superintendent or Monsanto Liaison personnel shall identify and determine the expected volume of chemical residue that will be generated as a result of a process change, rate increase, special operation, or new process addition.

A request for a waste disposal method shall then be made to the W.G.K. Environmental Control Group, Waste Control Specialist.

- B. The Waste Control Specialist will make such studies and investigations as he deems advisable. He may request additional data on physical and chemical characteristics, and may initiate toxicity screening studies, leachate tests and treatability studies. He will contact various approved disposal contractors to discuss the feasibility of disposal at their facilities.
- C. The Waste Disposal Specialist will select the best method of disposal and obtain all necessary approvals. He will then advise the appropriate Production General Superintendent, the Plant Technical Services and the General Superintendent, and the General Superintendent of Distribution and Services of the approved disposal method.
- D. If disposal is to be through a waste disposal contractor, the Environmental Control Group Waste Control Specialist will initiate the necessary arrangements in conjunction with Monsanto Purchasing Agent.
- E. The General Superintendent of Distribution and Services will advise the originator as to the required actions to insure safe and efficient handling, make arrangements at the landfill if applicable, and advise of proper labeling and shipping methods.

APPROVED BY SUPERINTENDENT:
Distribution & Services
Personnel

R. W. Flint, Plant Manager

K00066

MCO 0616687

FROM (NAME & LOCATION):

Robert L. Harness - Wm. G. Krummrich Plant

DATE

August 5, 1974

cc

P.B. Hodges
J.F. Nemeth
M.R. Foresman

SUBJECT

Inspection of Landfills by
the Illinois Environmental
Protection Agency

REFERENCE

TO

G.L. Bratsch
A. Gallion
G.A. Hippe
P.E. Heisler
C.F. Buckley

Last week an Illinois Environmental Protection Agency official, Mr. Kenneth Mensing, from the Collinsville office, visited the Monsanto Chemical Waste Landfill and the Sauget Trash Landfill. In a telephone conversation with Mike Foresman, he indicated that he was satisfied with our operations in both cases.

Mr. Mensing was informed by the guard, at the chemical landfill, that as of July 19th, we were depositing only solid wastes in the landfill. This satisfied him to the point that he elected not to inspect the landfill itself. We later confirmed this with Mr. Mensing and assured him that only non-hazardous, solid wastes, generated by Monsanto, were being landfilled.

Mr. Mensing stated that under this conditions, we could, in fact, operate the landfill without a permit.

This is not a final ruling from the Environmental Protection Agency, but is certainly a step in the right direction with the local office.

Mr. Mensing said we would be informed prior to their next inspection.



Robert L. Harness
Environmental Control

dm

MCO 0616688

K00067

APPENDIX C

Index of Documents

Memo dated 10/27/75 re IEPA landfill inspection - chemical composition (000174 to 000178)

Memo dated 6/4/74 re toxicity studies (000179 to 000180)

Memo dated 7/19/74 re chemical disposal (000181)

Memo dated 7/19/74 re landfill operation (000182 to 000184)

Progress report dated 7/24/68 landfill material quantity (000185 to 000186)

C

]

MCO 0616690

Monsanto

000174

FROM (NAME & LOCATION):

Robert L. Harness - William G. Krummrich Plant

DATE

October 27, 1975

CC:

P.E. Heisler
C.F. Buckley
M.R. Foresman
J.C. Smith
B.R. Williams
J.F. Nemeth

SUBJECT

ILL. EPA INSPECTION OF LANDFILL

REFERENCE

Memo Oct. 10, 1975 R.L.H. to
R.W. Flint, et.al.

TO

R.W. Flint
A. Gallion
P.S. Park
D.B. Hosmer
M.A. Pierle

As outlined in the above referenced memo, the Illinois Environmental Protection Agency followed their landfill site inspection with a plant visit to W.G.K. On October 24, 1975, Dale Montgomery of the Collinsville Land Pollution Control Surveillance Office, and Mark Taylor of the Springfield Land Pollution Control Section visited W.G.K. to discuss two items:

- a) A list of materials being disposed of in the chemical landfill.
- b) Landfill operation and control procedures.

In answer to their inquiries, I supplied them with a list of landfill materials, (reviewed by Corporate Law and MICC Environmental Protection), and verbally described a) our screening process involving corporate medical to determine which items are suitable for landfill; b) our procedures for transporting materials from the plant to the landfill; and c) our control measures to insure that only approved materials go to the landfill.

Their response to the above was as follows:

- a) In reviewing the list, both Mr. Montgomery and Mr. Taylor stated that they did not recognize any material of an obviously hazardous nature. Mr. Taylor was present specifically for this reason.
- b) They seemed quite satisfied with our procedure for determining which materials are "non-hazardous", and consequently approved for landfill.
- c) They likewise seemed satisfied with our security procedures, and with our ability to control the use of the landfill to approved items only.
- d) Mr. Montgomery stated that the Illinois EPA was actively working to prohibit landfill operations in Mississippi River flood plain areas. Despite his initial observation that our landfill wastes

MCO 0616692

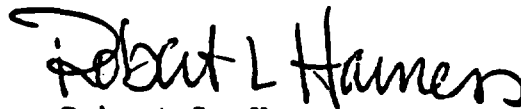
seemed "non-hazardous", he stated that the Agency would "probably" officially notify us that we were being cited for disposal of hazardous wastes in an un-authorized (no permit issued) site, and furthermore that they would under no circumstances issue a permit for this site. To this I replied that Monsanto had reviewed each item on the landfill list in detail to insure that it was "non-hazardous", and would not prohibit us from operating the landfill under the permit exclusion clause in the Illinois Act.

- e) Mr. Montgomery offered to discuss alternate landfill sites which would be acceptable to the Illinois EPA. We agreed that this would be best done at a later date.
- f) The EPA will be collecting water samples from the landfill test wells on Tuesday, October 28, 1975. This has been done on several other occasions.

The meeting ended on a positive note. Mr. Montgomery stated that he would review our situation, and discuss his decision with me prior to taking any action. He told me that no "crash program" would be enforced on us, but did not indicate any timing for activity on their point. He was very inconclusive at this point, and led me to believe that he was giving equal thought to approving our present operations.

At this point, I recommended that we continue to operate the landfill as we are presently doing, and take no action until further notice by the EPA.

Let me know if you have questions.



Robert L. Harness
Environmental Control
Wm. G. Krummrich Plant

/db

MCO 0616694

CONFIDENTIAL

000176

**WASTE MATERIALS DISPOSED OF AT
MONSANTO/SAUGET LANDFILL SITE**

1. Stabilizer Residue
 - 50% Aromatic Tars
 - 50% Inorganic Iron and Sulfur Compounds
2. Spent Vanadium Catalyst
3. Vacuum Distillation Residue
 - 90% Aromatic Tars
 - 5% Potassium Chloride
 - 5% Potassium Carbonate
4. Phosphate Ester Residue
 - 70% Polymerized Phosphate Ester
 - 18% Organic Tars
 - 12% $MgCl_2$
5. Dry Bleach - Scrap Product
6. Phosphorus Pentasulfide - Scrap Product
7. Spent Activated Carbon
8. Sludge from chlor-alkali sulfide treatment system,
and gyp from brine treatment.
9. Filter Mud
 - 83% Lime
 - 15% Dicalite Filter Aid
 - 2% Dye Residue
10. Still Residue
 - 30% Phenacetin
 - 60% Organic Tars
 - 10% P-chloracetanilid

MCO 0616695

11. Still Residue

40% Methyl Salicylate
20% Organic Tars
40% Hydroxy Isophthalate

12. Asprin Powder Scrap

13. Process Residue

85% Sulfones
15% Toluene Sulfonyl Chloride

14. Process Residue

100% Toluene Sulfonamides

15. Filter Cake

97% Carbon
3% Organics

16. Still Residue

20% Iso-Ethavan
30% Ethavan Dialdehyde
50% Organic Tars

17. Process Residue

17% Zinc Chloride
83% Phthalylchloride Fractions

18. Filter Cake

50% Filter Cake
20% Carbon
20% Alumina
10% Solka Flock

19. Filter Cake

50% Dicalite Filter Aid
50% Plasticizer

MCO 0616696

20. Filter Cake

50% Santicizer 8
48% Dicalite Filter Aid
2% Carbon

21. Process Residue

80% Benzoic Acid Residue
20% Organic Tars

22. Process Residue

50% Polyethylene Glycol
40% Trimethoxy - Benzaldehyde

23. Santolite MS or MHP

Scrap Product

FROM (NAME & LOCATION):

Robert L. Harness, William G. Krummrich Plant

DATE

June 4, 1974

cc

G. A. Hippe/P. E. Heisler/
P. B. Hodges/C. F. Buckley

SUBJECT

Toxicity Studies of WGK Residues

REFERENCE

TO

: Dr. Frederick R. Johannsen

Fred,

Per our telephone conversation of June 4, I am sending you the following samples of wastes intended for disposal at the Sauget toxic landfill.

1. PNA filter mud (one sample jar)
composition: 83% Ca(OH)_2
15% Dicalite (filter aid)
2% Para Nitro Aniline

2. GYP and Sulfide Sludge (two sample jars)
composed of mercury sulfide from the in plant treatment process. The samples I am sending have not been dewatered. We plan to dewater the sludge by filtration before landfilling in the future.

3. Stabilizer Residue (one bottle)
composition: 30% Fe Cl_3
20% Sulfur
50% Chlorinated Benzene

MCO 0616698

4. S-140 Residue (one bottle)
composition: complex phosphate ester with some cresylic acid and Mg Cl_2 . This is not the same as the TPP residue analyzed previously.

We also plan to landfill a residue called Orthene Still bottoms, but a sample will not be available for several months. This material will be similar to the Stabilizer residue above, in that it will be primarily chlorinated benzene tars. I'll get a sample for you as soon as it is available.

Finally, as we discussed, I am not sending samples of the following chemical wastes which in composition are essentially identical to their final product form:

1. ACL scrap material (mostly ACL 66 and 85 that has become contaminated with dirt, grease, etc.)
2. Phosphorous Pentasulfide (scrap material that has been spilled during manufacturing).

K 02048

June 4, 1974
Page two

Dr. Frederick R. Johannsen

3. Spent Carbon (carbon from a filter bed used to remove trace impurities including mercury, from a hydrogen gas stream).

Let me know if you still feel we have adequate toxicity information on the above.

Thanks for your help. Let me know if you need further information.

Bob

Robert L. Harness
Environmental Control
Group

RLH:ejh

MCO 0616700

K 02049

FROM (NAME & LOCATION)

J. F. Nemeth - J. F. Queeny Plant

DATE

July 19, 1974

cc

M. J. Smid

A. E. Peterson

D. C. Malm

RECY

CHEMICAL WASTE FOR SAUGET LANDFILL

REVENUES

TO

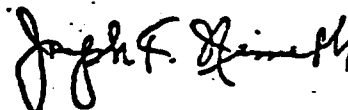
Robert L. Harness - WGK

This memo confirms our telephone conversation relative to the verbal approval given by Dr. Frederick Johannsen of the Medical Department on 7/19/74 for the disposal of the following JFQ wastes at the present time to the Sauget Landfill.

- 7/24 ✓ 310 Phenacetin Residue
- 7/24 ✓ 316 Methyl Salicylate Residue
- 7/24 ✓ 319 Aspirin Powder
- 7/24 ✓ 335 TSC1 Residue
- 7/24 ✓ 336 Tech. Amides
- 7/24 ✓ 343 Refined Amide Filter Cake
- 7/24 ✓ 354 Ethavan Still Residue
- 7/24 ✓ 373 Benzoic Residue
- 7/24 ✓ 389 TMB Residue
- 7/24 ✓ 389 Sant. IHP or MS
- Lab solid waste

We are awaiting the completion of tests for approval to dispose of other wastes.

J. F. Nemeth



:mj1

8/21/74

DPP Filter Cake
Vanadium Catalyst
Sant. B Res. Filter Cake
Sant. B Sp. Filter Cake
Alkyl Cl Still Res.
OS59 Filter Cakes

MCO 0616701

K00068

STANDARD FORM NO. 64

FROM (NAME & LOCATION)

Robert L. Harness - William G. Krummrich Plant

DATE

July 19, 1974

cc P.E. Heisler
 C.F. Buckley
 P.B. Hodges
 F.R. Johannsen
 M.R. Foresman
 D.C. Armstrong
 E.R. Billen
 G.L. Bratsch
 E.C. Chrisman
 C.N. Deubner
 W.C. Engman
 G.J. Geers
 J.F. Hart
 G.A. Hippe
 H.J. Horner
 J.C. Hume
 A.E. Leisy
 D.K. Lynch
 A. Gallion
 D.B. Redington
 L.W. Sprandel
 R.M. Stovall
 G.W. Watson
 B.R. Williams

SUBJECT

Operation of Chemical
 Waste Landfill

REFERENCE

TO :

F. Regula
 W. Krull
 J. Stal
 G. Johnson
 D. Dealy
 W. Ban
 J. Labanosky
 S. Henderson
 T. Rasmussen
 D. Geib
 J. Grant
 R. Ganote
 G. Davis
 J. Petterson
 J. Smith

OBJECTIVE

To summarize the Krummrich Plant chemical residues which will be disposed of in the Sauget landfill after July 19, 1974, and to summarize the guidelines for future landfill considerations.

BACKGROUND

The Illinois Pollution Control Board regulations which became effective July 19, 1974, permit use of the landfill only for disposal of non-hazardous, solid wastes. Toxicity studies, physical data and leachate information has been collected to determine which Krummrich Plant wastes fall into this classification. Alternate disposal means were then found for liquid, or hazardous wastes. Similar efforts were undertaken for Queeny Plant and G.O. research wastes.

CONCLUSIONS/RECOMMENDATIONS

1. The following W GK wastes have been approved for disposal at our landfill:

MCO 0616703

K00060

Page 2
 F. Regula et. al.
 July 19, 1974

	<u>DEPARTMENT</u>	<u>WASTE</u>	<u>FORM</u>
	<u>1b/4R-1975</u>		
✓ 222	2,200,000	PNA Filter Mud	Dumpster Box
- 731	3,000,000	Gyp and Sulfide Sludge filter cake	Dumpster Box
- 235	13,000	Spent Carbon	Dumpster Box
- 245	200,000	P ₂ S ₅ Scrap	Dumpster Box
- 251	35,000	ACI scrap	Dumpster Box
- 248	700,000	TPP Residue	Drums
- 255	1,650,000	4-NDPA Residue	Drums
LAB	80,000	Solids	Drums
- 233	18,000	Stabilizer Residue	Drums

Supervision at the landfill has been instructed to the fact that only the above items are to be accepted.

2. Additions or changes to this list will have to be handled on an individual basis. Please contact me as far in advance as is possible to discuss a suitable disposal means.

Please call me if you have questions.

Bob

Bob Harness
 Environmental Control
 Station 542

dm

MCO 0616705

K00061

J.F. QUEENY PLANT

MCO 0616706

Figure 1

CHEMICAL WASTE DISPOSAL						
DISPOSAL METHOD	COST CENTER WASTE PRODUCT	VOLUME M LBS/YR.	SHIP MODE	DISPOSAL SITE	BACK UP DISPOSAL	ACTION/PROJECTS BY 7/1/74
A. LANDFILL	✓310 Phenocetin Still Residue	100	44 Gal. LVP	Sauget		
	✓316 Methyl Sal. Still Res.	10	55 Gal. Drum	Sauget		
	✓319 Aspirin Powder	12	44 Gal. LVP	Sauget		
	✓335 TSCI Residue	566	55 Gal. Drum	Sauget		
	✓336 Tech. Amides	10	55 Gal. Drum	Sauget		
	343 Refn. Amide Filter Cake	36.5	55 Gal. Drum	Sauget		
	✓354 Ethoven Still Res.	33	55 Gal. Drum	Sauget		
	✓363 Phthalyl Cl Still Res.	25	55 Gal. Drum	Sauget		
	363 Dimer Filter Cake	9.4	55 Gal. Drum	Sauget		
	✓363 OS-59 Filter Cake	2.2	55 Gal. Drum	Sauget		
	363 OS-128 Filter Cake	.6	55 Gal. Drum	Sauget		
	363 OS-140 Filter Cake	2	55 Gal. Drum	Sauget		
	363 OS-152 Filter Cake	.3	55 Gal. Drum	Sauget		
	✓364 DPP Filter Cake	15.0	44 Gal. LVP	Sauget		
	366 Sant. 1-H Filter Cake	.7	30 Gal. Drum	Sauget		
	✓366 Sant. 8 Filter Cake	7.5	30 Gal. Drum	Sauget		
	✓366 Sant. 8 Sp. Filter Cake	3.2	30 Gal. Drum	Sauget		
	✓373 Benzoic Residue	4.4	55 Gal. Drum	Sauget		
	375 Maleic Catalyst	88	55 Gal. Drum	Sauget		
	389 MP-BCI Residue	2.5	55 Gal. Drum	Sauget		
	389 MP-Fumarate Res.	.5	55 Gal. Drum	Sauget		
	✓389 THB Residue	7	55 Gal. Drum	Sauget		
	✓389 Sant.MHP or MS	20	7 Gal. Can	Sauget		
		<u>964.6</u> 964.6				
	306 PMP Residue	15	55 Gal. Drum	Texas	Incin. Rollins/Hyon	
	385 DCA Residue	120	55 Gal. Drum	Texas	Incin. Rollins	
	385 PCE Residue	535	55 Gal. Drum	Texas		
	389 C-22 Residue	2.2	55 Gal. Drum	Texas	Incin. Rollins	
		<u>672.2</u> 672.2				

Proj. 13130 Drumming & Exh. S

J. F. Moneth

K00062

000184

PROJECTS REPORT

JOHN F. QUEENY PLANT
TECHNICAL SERVICES DEPARTMENT

ESTIMATE NO. 000185
JOB NUMBER 370-E-07
REPORT NUMBER 83
DATE July 24, 1968

JOHN F. QUEENY PLANT		GENERAL OFFICES		UN BUILDING		OTHERS	
<input checked="" type="checkbox"/> L. AYNAPOI	<input checked="" type="checkbox"/> G. L. JENSE	<input type="checkbox"/> D. DANNA (4)	<input type="checkbox"/> C.E. ANAGNOSTOFIDIS	<input type="checkbox"/> W.J. WILSON - WCK	<input type="checkbox"/> J.F. QUINN	<input type="checkbox"/> L.C. FURFENTER - ALIATED	<input type="checkbox"/> W. KELLOGG - NITRO
<input checked="" type="checkbox"/> W.L. Wilson	<input type="checkbox"/> P.A. KANAPPELL	<input type="checkbox"/> M.L. SAMPLE	<input checked="" type="checkbox"/> J.E. SMITH	<input checked="" type="checkbox"/> M.L. HUBBARD	<input type="checkbox"/> M.W. FARRAR	<input type="checkbox"/> J.F. WHITE - EVERETT	<input type="checkbox"/> B.G. MC GUIRE - DROSEFOR
<input checked="" type="checkbox"/> D.M. CAMPBELL	<input checked="" type="checkbox"/> D.E. MURIE	<input type="checkbox"/> J.E. SMITH	<input type="checkbox"/> J.J. STAMMEYER	<input type="checkbox"/> W.R. RICHARD	<input type="checkbox"/> T.P. SANDS	<input type="checkbox"/> J.F. WHITE - EVERETT	<input type="checkbox"/> B.G. MC GUIRE - DROSEFOR
<input type="checkbox"/> J.D. CLARK	<input type="checkbox"/> J.W. BARNETER	<input type="checkbox"/> J.E. HOWARD	<input type="checkbox"/> J.O. BRIGHT	<input type="checkbox"/> W.R. RICHARD	<input type="checkbox"/> T.P. SANDS	<input type="checkbox"/> J.F. WHITE - EVERETT	<input type="checkbox"/> B.G. MC GUIRE - DROSEFOR
<input type="checkbox"/> W.G. COLTER	<input type="checkbox"/> J.E. RODGERS	<input type="checkbox"/> J.O. BRIGHT	<input type="checkbox"/> J.O. BRIGHT	<input type="checkbox"/> W.R. RICHARD	<input type="checkbox"/> T.P. SANDS	<input type="checkbox"/> J.F. WHITE - EVERETT	<input type="checkbox"/> B.G. MC GUIRE - DROSEFOR
<input type="checkbox"/> F.W. CORANAS	<input type="checkbox"/> J.M. SAVAGE	<input checked="" type="checkbox"/> D.B. Hosmer	<input checked="" type="checkbox"/> D.B. Hosmer	<input type="checkbox"/> W.R. RICHARD	<input type="checkbox"/> T.P. SANDS	<input type="checkbox"/> J.F. WHITE - EVERETT	<input type="checkbox"/> B.G. MC GUIRE - DROSEFOR
<input type="checkbox"/> J.L. CORDER	<input type="checkbox"/> M.L. SCHNEIDER	<input checked="" type="checkbox"/> P.B. Hodges	<input checked="" type="checkbox"/> P.B. Hodges	<input type="checkbox"/> W.R. RICHARD	<input type="checkbox"/> T.P. SANDS	<input type="checkbox"/> J.F. WHITE - EVERETT	<input type="checkbox"/> B.G. MC GUIRE - DROSEFOR
<input type="checkbox"/> S. LYON	<input type="checkbox"/> E.G. FORD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> K.M. FRANK	<input type="checkbox"/> R.M. SCOTT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> F.F. GATENS	<input type="checkbox"/> R.C. SPRAGUE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> R.A. GEISMAN	<input type="checkbox"/> B.L. THOMPSON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> G.A. HIPPE	<input type="checkbox"/> TSD FILE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☒ To Receive Details Section ☒ To Receive Summary Only

Waste Disposal -- Sanitary Land Fill

PERSONNEL: J. F. Nemeth (J. L. Solari)

PROBLEM: Determine quantity of waste material sent to sanitary land fill.

MARY: During the twelve month period of July 1, 1967 through June 30, 1968, the John F. Queeny Plant disposed of 5876 cubic yards of waste material to the sanitary land fill at the WCK Plant.

Dept. A-5	(Nitrochlorobenzene)	1662 cubic yards
E-5	(Phenacetols and Pheneticidines)	295
A-9	(Phthalic Anhydride)	445
35	(Oil Additive)	101
49	(Maleic Anhydride)	18
50	(Sanitizer 141)	11
53	(Benzole)	1005
54	(Bisphenol)	45
55	(TSCl)	20
62	(TCC & DCA)	1102
S-460		8
"W" Bldg.	(S-856)	17
"W" Bldg.		0
155	(Research)	1019
Kalcolor		8
Cyclamates		8
Central Drumming		6
Sanitation		101

MCO 0616707

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KJ00005

J. F. QUEENY PLANT WASTE DISPOSAL TO
SANITARY LAND FILL AT WCK PLANT
(Cubic Yards)

MCO 0616709

Month	A-5	E-5	A-9	35	49	50	53	54	55	62	S-460	W Bldg. S-856	WW Bldg.	155	Kal- Color	Cycl- mates	Cent. Drum	Sani- tation
1967																		
July	167	34	31				112			78				28				22
Aug.	133	22	31		6	11	74			67				50				22
Sept.	93	22	31		6		81			67				56				22
Oct.	148	28	19	34			68			59				84				6
Nov.	152	22	25				81			47				168				
Dec.	182	11	25	6			81			53				146				
1968																		
Jan.	153	28	25	17			93			144				196				
Feb.	74	28	66				87			140		17		62				17
Mar.	87	39	31				99			115			6	95				6
Apr.	193	34	74	22	6		99	28		118				84				
May	122	28	31	22			37	17		115				50			6	6
June	158		56				93		20	99	8				8	8		
Totals	1662	296	445	101	18	11	1005	45	20	1102	8	17	6	1019	8	8	6	101

Total To Sanitary Land Fill = 5878 Cu. Yds.

K000006

000186

D

]

MCO 0616710

APPENDIX D

Index of Documents

Letter dated 2/25/80 re site description (000187 to 000190)

Notes dated 11/9/79 re site description (000191)

Progress report dated 4/8/71 re volumetric calculations (000192 to 000194)

Chart dated 1/1/68 re volumetric calculations (000195 to 000199)

Letter dated 8/16/68 re list of chemicals and quantities (000200 to 000202)

Letter dated 11/27/72 re list of chemicals and quantities (000203 to 000204)

Memo dated 1/27/77 re list of chemicals and quantities (000205 to 000207)

Notes on Eckhardt survey (000208 to 000211)

Lists dated 2/10/77 re Queeny Plant 1976 disposal (000212 to 000214)

Progress Report dated 1/3/69 re characterization of materials (000215 to 000219)

Progress Report dated 8/20/70 re composition and volume of materials (000220 to 000222)

Report dated 5/18/81 re EPA notification of hazardous waste site (000223 to 000226)

Memo dated 4/3/74 re composition and quantity of materials (000227 to 000230)

MCO 0616711

000187

XXXXXXXXXXXXXXXXXXXX

(618) 345-0700

Refer to: St. Clair County - LPC 163 121 02 - Sauget/Monsanto

February 25, 1980

Richard Sinise
Environmental Control Section
Monsanto, Krummrich Plant
Sauget, Illinois 62201

Dear Mr. Sinise:

I am writing this letter as a result of your telephone conversation with John DeSelm of this Agency on February 22, 1980.

The Illinois Environmental Protection Agency is compiling information on sites listed in the Eckhart Report. This report, you will recall, requested basic information on disposal practices of major U. S. companies of which Monsanto was one.

The information IEPA is requesting concerning your on-site disposal facilities is:

- location (a diagram of the plant grounds locating the facilities would be helpful)
- geologic and hydrogeologic information
- monitoring capabilities
- facility design criteria
- disposal practices (i.e.; landfill, open dump, burning, was daily cover applied, etc.)
- closure procedures and post closure monitoring (if any)
- time frame the facility was used
- composition of waste streams disposed
- quantity of waste streams disposed

Any of the above information or other pertinent information you can supply will be appreciated. Thank you for your time and consideration.

Sincerely,

Kenneth G. Mensing, Southern Region Manager
Land Field Operations Section
Division of Land/Noise Pollution Control

KGM:JJD:jlr

cc: Division File
Southern Region

MCO 0616712

KM
JO —

000188

Monsanto

Carroll my only copy

MONSANTO CHEMICAL INTERMEDIATES CO.
Sauget, Illinois 62201
Phone: 618/ 271-5835

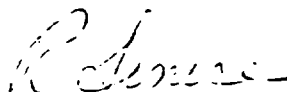
March 3, 1980

Ken G. Mensing
Southern Region Manager
Division of Land/Noise Pollution Control
Illinois Environmental Protection Agency
115 A West Main
Collinsville, IL 62234

Dear Mr. Mensing:

Enclosed are the landfill closure documents that were
filed with the St. Clair Recording Office. This meets
W.G. Krummrich's requirement concerning Rule 318(c) of the
Solid Waste Regulations.

Sincerely,



Richard H. Sinise

RHS:bag

Enclosure

cc: P.H. Smith
P. E. Heisler

MCO 0616714

2481 1899

RIVER VIEW AVE

MONSANTO

000189

700

841.96

UNION ELECTRIC CO. 230KV TRANSMISSION LINE EASEMENT

1300

1169.12

UNION ELECTRIC CO. 138KV TRANSMISSION LINE EASEMENT

MONSANTO CO. PROPERTY

3015

240

MCO 0616715

STATE OF ILLINOIS)
COUNTY OF ST. CLAIR) SS 2481 1898

000190

AFFIDAVIT OF RICHARD H. SINISE

2481 1898

RICHARD H. SINISE, Environmental Control Engineer, at Monsanto Company's W. G. Krummrich Plant located in Sauget, Illinois, first being duly sworn, upon his oath, states as follows:

(1) That pursuant to Illinois Solid Waste Regulations, Chapter 7, Rule 318(C), a detailed description of the Monsanto Company W. G. Krummrich Plant industrial waste landfill site, located in Sauget, Illinois ("Site"), along with a plat of the Site area is provided herewith to be placed on file in St. Clair County, in the Recorder of Deeds Office.

(2) That the Site is located on a tract of land composed of portions of the accretions to the Third Subdivision of the Cahokia Commons in United States Survey No. 739, St. Clair County, Illinois, and described as beginning at the point of intersection of the southwestern line of Riverview Avenue (vacated), 70 feet wide, as established by Ordinance No. 122 of the Village of Monsanto, Illinois (now Sauget, Illinois) and vacated by Ordinance No. 436, with the northwestern line of the 230 K.V. Transmission Line Easement for Union Electric Power Company recorded in Book 1284, page 28 of the St. Clair County Recorder of Deeds Office; thence running in a generally southwestwardly direction two bearings and distances for a total distance of 2011.08 feet along the northwestern line of said Union Electric Power Company Easement to a point marked by a 2" diameter pipe; thence northwestwardly on a line parallel with the southwestern line of Riverview Avenue (vacated) a distance of 430 feet to a point from which a 2" diameter pipe bears northwest 3 feet; thence northeastwardly 2015 feet to a point of intersection with the southwestern line of Riverview Avenue (vacated), that point being .55 feet northwestwardly from the point of beginning; thence 455 feet to the point of beginning.

(3) That a plat of the Site is attached hereto as Exhibit A, on which is marked with a solid black line a location which corresponds with the description set forth in paragraph (2) above.

(4) That the Site contains various industrial wastes generated as a result of chemical manufacturing operations.

Richard H. Sinise
Richard H. Sinise
W. G. Krummrich Environmental
Control Engineer

Subscribed and sworn to me this 10th day of December, 1979, by RICHARD H. SINISE, who personally appeared before me and is known to me to be the person described in and who executed the foregoing Affidavit, and acknowledged that he executed the same as his free act and deed, and that the information contained therein is true to the best of his knowledge and belief.

In Witness Whereof, I have hereunto set my hand and affixed my official seal.

My commission expires _____

Notary Public

MCO 0616716

Monsanto
C O M P A N Y

000200

Seuget, Illinois 62201
(618) 271-5835

August 16, 1968

Mr. C. W. Klassen
Technical Secretary
State of Illinois Sanitary Water Board
Springfield, Illinois 62706

Dear Mr. Klassen:

In reply to your letter of August 7, 1968, I have the following information which you need to set up a monitoring program for our industrial waste disposal site.

In general we deposit at this site those wastes which would add to the sludge load at the waste treatment plant or would dissolve in our wastewater and add to the phenol content, C.O.D. or color of the final effluent. Chemically, they fall into 6 main groups:

1. Phenols
2. Aromatic Nitro Compounds
3. Aromatic Amines and Nitro Amines (highly colored)
4. Chlorinated aromatic hydrocarbons
5. Aromatic and aliphatic Carboxylic acids
6. Condensation or reaction products of the above

A more detailed list of sources and quantities follows:

1. Still Residues - tars, condensation and decomposition products of doubtful composition but with some of the primary product remaining.

From the Distillation of:

Approx. Annual Amount

a. Phenol	1,020 Cu. yds.
b. Chlorophenol	720 Cu. yds.
c. Nitro-Aniline and similar compounds	1,700 Cu. yds.
d. Chlorobenzol (Tri-Tetrachlor)	130 Cu. yds.
e. Chloro aniline	1,100 Cu. yds.
f. Other aniline derivatives	200 Cu. yds.
g. Nitro benzene derivatives	100 Cu. yds.
h. Aromatic carboxylic acids (Maleic, Phthalic, etc.)	1,500 Cu. yds.
i. Chlorophenol Ether	350 Cu. yds.

MCO 0616729

K00015

Mr. C. W. Klassen

-2-

August 16, 1968

2. By-Products -

a. Mixed isomers of nitrochlorobenzene	1,700 Cu. yds.
" " " Dichlorophenol	3,000 Cu. yds.
b. Waste Maleic Anhydride	730 Cu. yds.
c. Waste Chlorobenzenes and Nitro- chlorobenzenes	120 Cu. yds.

3. Contaminated Water and Acids -

a. Water with varying amounts of phenols (0-15%)	7,200 Cu. yds.
b. Waste Sulfuric acid with chlorophenol present	1,500 Cu. yds.
c. Caustic Soda Solution with chlorophenol present	5,300 Cu. yds.

4. Waste Solvents -

a. Waste Methanol contaminated with Mercaptans	600 Cu. yds.
b. Waste Isopropanol - Water and chlorinated hydrocarbon	5,500 Cu. yds.
c. Research Waste: Miscellaneous Solvents and Materials	1,019 Cu. yds.
d. Oily Materials from Oil Additive Production	101 Cu. yds.

5. Filter Sludge -

a. Attapulugus Earth -Keisulguhr from Alkyl Benzene filtration	600 Cu. yds.
b. Lime Mud from nitro-aniline production..	1,000 Cu. yds.

6. Unwanted Samples and Waste resulting
from taking samples -

a. Chlorophenols	72 Cu. yds.
b. Laboratory Samples (Everything)	208 Cu. yds.

MCO 0616731

K00016

Mr. C. W. Klassen

-3-

August 16, 1968

7. Miscellaneous Wastes -

These consist of spoiled material, floor sweepings, sludge from cleaning equipment and storage tanks etc which would cause problems if sewerred. They are mostly reaction products of the above materials eg Esters of phenols or aliphatic alcohols with carboxylic acids such as phthallic, Maleic, or Benzoic acid, Anilides, Sulphonated phenols or other aromatics.

The relative quantities of these materials will necessarily vary according to sales of particular products and there will be additions to and deletions from this list. However, the general chemical classification will remain much the same.

Please let me know if you need any additional information.

Very truly yours,

J. R. McClain
Plant Manager

Jo.

MCO 0616732

K00017

A Tract of land composed of portions of the accretions to the Third Subdivision of the Cahokia Commons in United States Survey No. 739, St. Clair County, Illinois, and described as beginning at the point of intersection of the southwestern line of Riverview Avenue, 70 feet wide, as established by Ordinance No. 122 of the Village of Moreland, Illinois (Now Sargent, Illinois), with the northwestern line of the 230 KV. Transmission Line Easement for Union Electric Power Company recorded in Book 1284, Page 28. of the St. Clair County, Illinois, Recorder's Office, and thence running south-westwardly ~~444.91~~ ^{2011.08} feet along the northwestern line of said Union Electric Power Company Easement to a point; thence northwestwardly on a line parallel with the southwestern line of Riverview Avenue a distance of 430 feet to a point; thence Northeastwardly ~~401.5 feet~~ ^{401.5 feet} to a point of intersection with the southwestern line of Riverview Avenue, that point being 455 feet northwardly from the point of beginning; thence 455 feet to the point of beginning.

Landfill description given
to R. Sinise 11/9/79 to use
in govt recordings of landfill

PROGRESS REPORT

JOHN F. QUEENY PLANT
TECHNICAL SERVICES DEPARTMENT

ESTIMATE NO **LANDFILL**

JOB NUMBER

370-E-47

REPORT NO

104

DATE

4/8/71

JOHN F. QUEENY PLANT		GENERAL OFFICES	OTHER	000192
<input type="checkbox"/> L. AYNARDI <input type="checkbox"/> J. BERTOGLIO <input checked="" type="checkbox"/> R. H. BURR <input checked="" type="checkbox"/> J. D. CLARK <input type="checkbox"/> F. W. COPANAS <input type="checkbox"/> K. H. FRANK <input type="checkbox"/> J. D. GARRISON <input checked="" type="checkbox"/> P. F. GATENS <input type="checkbox"/> R. A. GEISMAN <input checked="" type="checkbox"/> G. A. HIPPE <input type="checkbox"/> M. J. KAUSCH <input checked="" type="checkbox"/> J. F. Nemeth <input checked="" type="checkbox"/> E. R. Reager	<input checked="" type="checkbox"/> D. C. MALM (2) <input type="checkbox"/> E. D. MALONE <input checked="" type="checkbox"/> D. E. MUNIE <input type="checkbox"/> D. S. REDINGTON <input type="checkbox"/> J. E. RODGERS <input type="checkbox"/> J. L. SOLARI <input checked="" type="checkbox"/> E. F. TAKE <input checked="" type="checkbox"/> B. L. TILFORD <input checked="" type="checkbox"/> R. L. WIESE <input type="checkbox"/> W. J. WILSON <input type="checkbox"/> G. R. WOOD <input checked="" type="checkbox"/> TSD FILE <input type="checkbox"/>	<input checked="" type="checkbox"/> D. DANNA (4) <input checked="" type="checkbox"/> F. J. HOLZAPFEL <input type="checkbox"/> D. S. HOSMER <input type="checkbox"/> R. E. HOWARD <input type="checkbox"/> M. P. LUX <input type="checkbox"/> BUSINESS GRP. DIR. <input type="checkbox"/> MANUFACTURING MGR. <input type="checkbox"/> RESEARCH MGR. <input type="checkbox"/> BUSINESS GRP. ENG. MGR.	<input type="checkbox"/> W. C. ROOS/T. M. PATRICK <input type="checkbox"/> O. DEGARMO/J. F. QUINN <input type="checkbox"/> J. C. LANDWEHR - ANN. <input type="checkbox"/> H. L. WILLIAMS - NITRO <input type="checkbox"/> J. F. WINKLER - BRIDGEPORT <input type="checkbox"/> L. J. GILBERT - EVERETT <input type="checkbox"/> D. W. JACKSON - WGK <input checked="" type="checkbox"/> P. B. Hodges-GO <input checked="" type="checkbox"/> M. Foresman-WGK <input checked="" type="checkbox"/> M. E. Batz -GO <input type="checkbox"/> <input type="checkbox"/>	

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☐ To Receive Summary Only

TITLE JFQ Solid Waste Disposal

PERSONNEL: L. D. Lorts (A. E. Peterson)

PROBLEM: Determine the volume and cost of liquid residue and solid waste disposal at JFQ during 1970.

SUMMARY: 12.54 m lbs. of liquid residues and solid wastes were disposed of at the WGK toxic dump and the Sauget landfill. During 1970 the total cost of disposal of this waste was \$127,709 (\$61,795 hauling, \$21,444 landfill operation, and \$44,549 for drums).

WGK Toxic Dump	<u>lbs/year</u>	<u>lbs/year</u>
1. In drums	4,949,865	
2. In trailers & tanks	4,430,280	
	<u>9,380,145</u>	9,380,145
Sauget Landfill (Trash Only)		
1. In dumpster boxes	3,161,600	<u>3,161,600</u>
Total		12,541,745

/kk

MCO 0616719

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370- E-47
 Report No. 104
 3/25/71
 Page 2

Table 1 details the volume of chemical waste disposed of at the WGK toxic dump, from JFQ in 1970.

TABLE 1

DEPT.	MATERIAL		TRAILERS & TANKS-LBS/YEAR	DRUMS LBS/YEAR
	LIQUID	SOLID		
C-5		O & P Chloroaniline, O & P Phenetidine, & O & P Anisidine tars.		1,871,328
53	Benzoic Acid Residue		865,280	
55	TSCI Residue			938,896
49		Spent Catalyst		163,295
62	DCA & MCB Still Residue		1,004,344	
54		Off grade BPA		6,787
A-5	ONCB & DNCB Residue		1,833,435	
32	Phthalyl Chloride Resi- due, Carbon, & Filter aid			22,624
W Bldg	Methyl Mercaptol, Santo- lube 394-C, CP 53619 Tech., Phosgard-C22 R, Santolube 450, & Phos- gard 2xc -20	Aspirin, FH-132, BMT, Santowhite powder, & O-Nitroaniline		1,908,334
35	H ₂ S -lye - H ₂ O Solu- tion	Filter Aid	247,220	38,600
50	Phenol Residue		480,000	

MCO 0616721

K00008

The hauling and disposal cost of waste from JFQ in 1970 is detailed in Table 2.

TABLE 2

WGK Toxic Dump	<u>\$/Year</u>	<u>\$/Year</u>
1. Outside truckers	22,095	
2. Drum costs ($\frac{4.95 \text{ m} \#/\text{yr}}{500 \#/\text{drum}}$ x \$4.50/drum)	44,549	
3. Landfill charges	<u>18,144</u>	
	85,088	85,088
Sauget Landfill		
1. JFQ dumpster truck	39,700	
2. Landfill charges	<u>3,000</u>	
	42,700	<u>42,700</u>
Total	-	127,788

MCO 0616722

K00009

Table No. 1

MCO 0616723

Breakdown of Waste Handled at Krummrich's Sanitary Landfill Operation
(Cu. Yds./Year)

QueenyCombustible
Liquids

3010

Combustible
Solid

2406

Non-Combustible
Liquid 85-90% H₂ONon-Combustible
Chemical Solids

370

Non-Combustible
Trash

0

Krummrich80
(drummed)
3500(120)
(drummed)
4728
(Dumpster,
50% combustible)
670036,648
(diluted phenolic
waste)50
(drummed)
1332
(Dumpster)

Unknown

6590

13,954

36,648

1752Research and
General Offices255
(drummed)

Total Cu. Yds. to be Disposed = 59,289 Cu. Yd./Year

K00026

000195

11/1/63

TABLE 2
SOLID WASTE CHARACTERIZATION
MATERIAL IN DRUMS

MCO 0616725

DEPT	Volume			Combustibles	Viscosity	pH	Composition	Toxic
	Gal/Mo.	Drums/Mo.	Lbs/Mo.	lbs/mo.	"Ambient"			
<i>Landfill</i> Lab		65		1,000			Samples, Bottles, glass	Yes
<i>Landfill</i> 283	1650	30	16,500	16,500	Solid		Oil Additives	No
<i>Burn</i> 236	1100	20	10,000	9,500	Liquid		DCP, Penta	Yes
<i>Landfill</i> 266	770	14	6,000	600	Liquid		P ₂ S ₅ , H ₂ O	Yes
<i>Landfill</i> 250		12	6600		Solid		P ₂ S ₅ , P, Phos- phorus Mud	Yes
<i>Landfill</i> 251		10	2,500		Solid		AC1	Yes
<i>Landfill</i> 222		7	4,000	3,600	Solid	Acid	ONA Residue	Yes
<i>Burn</i> 254	220	4	2,000	2,000	Liquid		TPP, Phenol	Yes
<i>Burn</i> 217	55	1	500	500	Liquid		DCP, Biphenyl Aroclor	Yes

107,680 gal/yr. 163 8,900,000 lb/yr.

K00027

A-1

000196

TABLE 3
SOLID WASTE CHARACTERIZATION
MATERIAL IN DUMPSTERS

MCO 0616726

DEPT	Volume lbs/mo	c.y./mo	Combustibles lbs/mo.	Viscosity "Ambient"	Composition	Toxic
232	255,000	65		Solid	gyp	No
258	180,000	115	90,000	Solid	dicalite, ABSA	Yes
270	150,000	150	75,000	Solid	dicalite, S-290, No.5 oil, M-5393	Yes
257	90,000	84	45,000	Solid	Clay, SAB	No
275	70,000	45	36,400	Solid	PBSA, S-900	Yes
222	37,500	20		Solid	Ca(OH) ₂ , dicalite	No
266	35,000	26		Solid	dicalite, ZnO	No

817,500

505

171,400

65

K30028

A-2

000197

TABLE 4
SOLID WASTE CHARACTERIZATION
CONCENTRATED LIQUID WASTES

MCO 0616727

DEPT	Volume Gal/mo.	Combustibles Lbs/Mo	Viscosity "Ambient"	pH	Composition	Toxic
273	38,430	365,000	Solid	8.0	ODCB - 32% TCB - 24% ONCB - 37%	Yes
267	4,500	33,750	<i>Tetra Chl. Hydro</i>		TCP - 25% Dimer - 50%	Yes
223	36,000	270,000	Liquid	8.0	<i>Suppressed 70, H.O.</i>	
	49,500	125,000	Semi-solid	7-10	Phenol, NaBs, Sulfones, High Boilers	Yes
	150	750	Liquid	0-2	Benzene, H ₂ SO ₄	Yes
	6,000	12,000	Slurry	9-14	Phenol, NaBS NaOH	Yes
262	45,000	382,500	Solid	Acid	Chlorophenol, H ₂ SO ₄ Acetic	Yes
268	250	2,250	Solid		Alcohol, esters tar	Yes
233	1,000	7,000	Semi-Solid	6	S, FeCl ₃ , chlori- nated benzene	Yes
248	1,725	6,900	Liquid		Cresol, High Boilers	Yes
New	8,050	70,700	Solid		Esters, High Boilers	Yes
Depart-	280	2,800	Liquid		Phenol, Cresol COD, TCP - <i>Tri cresyl P</i>	Yes
ment	3,500	34,000	Solid		Phenetidine residue	Yes
247	12,500	120,000	Solid		Maleic Anhydride	Yes
275	6,000	60,000	Liquid		Methanol, Oil	No
270	25,000	200,000	Semi-Solid		Chlorinated Benzene	Yes
221	13,700	130,000	Solid		NDPA Residue	Yes
255	3,000	28,500	Solid		PCP, Santophen I	Yes
239						

NOTE:

Volume
calcula-
tions
based
on
10#/gal.

254,585 1,851,150

Para Chlor. Phenol

Nitro Diphenyl Amino

TABLE 5
SOLID WASTE CHARACTERIZATION
DILUTE LIQUID WASTE (PHENOL)

MCO 0616728

Dept	Volume		Combustibles lbs/mo.	Viscosity "Ambient"	pH	Composition	Toxic
	gal/mo.	lbs/mo					
258	120,000	1,000,000	125,000	Liquid		H ₂ O, Phenol, PSA	Yes
236- 237	260,000	2,600,000	35,000	Liquid	Acid	Spent Acid	Yes
	95,000	790,000	2,400	Liquid	Base	Scrubber Liquor	Yes
	65,000	540,000	65,000	Liquid	Base	Residue, H ₂ O	Yes
	5,400	45,000		Liquid		Water, DCP ²	Yes
223	2,400	20,000	1,000	Liquid		Process Water	
	36,000	300,000	7,500	Liquid	10-12	Santosite	Yes
	9,000	75,000	1,500	Liquid		Waste Liquor	
Rip Track	18,000	150,000	3,000	Liquid		Phenol Wash Water	Yes

610,800 5,520,000 240,400

176

$$\begin{array}{r} 50.00 \\ \times 50,000 \\ \hline 2,500,000 \end{array}$$

$$\begin{array}{r} 1000.00 \\ \times 2 \\ \hline 2000.00 \end{array}$$

$$\frac{3000}{150,000} = 2\%$$

(2.00)

K00030

000199
A - - 4

Monsanto

000203

MONSANTO INDUSTRIAL CHEMICALS CO.
Stuget, Illinois 62201
Phone: (618) 271-5835

November 27, 1972

Mr. William C. Child, Regional Supervisor
Surveillance Section - Division of Land Pollution Control
Illinois Environmental Protection Agency
115a West Main Street
Collinsville, Ill. 62234

Dear Mr. Child:

In response to the request you made in your recent visit to the W.G. Krummrich Plant, I have updated the list of material deposited by W.G.K. at its industrial waste desposal site.

The general catagories remain similar to the ones outlined in our August 16, 1968 letter. A detailed listing and quantities is as follows:

1. Still Residues - tars, condensation and decomposition products of doubtful composition, but with some of the primary product remaining. -

FROM THE DISTILLATION OF:

APPROX. ANNUAL AMOUNT

a. Nitro-Aniline and similar compounds	94 cu. yds.
b. Cresol, esters of phenol	1140 cu. yds.
c. Chlorophenol, Chlorophenol ether	774 cu. yds.
d. Chlorobenzol (Tri-tetrachlor)	13 cu. yds.
e. Aniline derovatives	208 cu. yds.
f. Nitro benzene derivatives	1190 cu. yds.
g. Chlorinated hydrocarbons	425 cu. yds.
2. By-products	
a. Mixed isomers of nitrochlorobenzene	785 cu. yds.
b. Mixed isomers of Dichlorophenol	1240 cu. yds.
3. Contaminated Acids & Caustic	
a. Spent sulfuric acid with chlorophenol present	1395 cu. yds.
b. Spent caustic soda with chlorophenol present	1760 cu. yds.

MCO 0616733

K00018

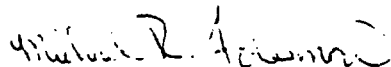
Page 2
M.R. Foresman
November 27, 1972

000204

4. Filter Sludges
 - a. Spent Carbon 12 cu. yds.
 - b. Lime mud from nitro-aniline production 1195 cu. yds.
 - c. Gypsum 5600 cu. yds.
5. Obsolete samples and Waste Resulting from taking samples
 - a. Chlorophenols 40 cu. yds.
 - b. Laboratory samples 150 cu. yds.
6. Miscellaneous Waste - Spoiled material, floor sweepings, sludge from cleaning equip. 915 cu. yds.

This list represents the types and approximate quantities of materials hauled from our plant during 1972. The quantities will change from year to year according to sales of particular products. Attached for your information is a map of the industrial disposal area showing the location of the five test wells.

Cordially yours,



M.R. Foresman
Senior Engineer -
Environmental Control

dm

Attachments

CC: P. Heisler

MCO 0616735

K00019

Monsanto

000205

FROM: NAME & LOCATION M. W. McCombs

DATE January 27, 1977

cc J. H. Waldbeser

SUBJECT JFQ USAGE OF WGK LANDFILL

H. D. Latina

F. J. Basile

REFERENCE MAP Memo to CD of January 14, 1977

C. R. Schrock

C. Downing

TO : M. A. Pierle

Attached is the information requested in referenced memo regarding the status of J. F. Queeny wastes as they relate to the operations and closure of the W. G. Krummrich Plant Landfill. Incremental disposal costs for JFQ are included in F. J. Basile's evaluation of landfill closure costs.

Max
Max W. McCombs

$\frac{\frac{\frac{K+E}{II}}{Site R}}{\# 3}$

$\frac{\# 7}{C}$

MCO 0616736

J. F. QUEENY USAGE OF W. G. KRUMMRICH LANDFILL

<u>Waste Material</u>	<u>Volume K lbs/yr</u>	<u>Months Till DOT Approval¹</u>
Phenacetin Still Residue	60	3
TSCI Residue	570	3
Tech. TS Amides Reject	18	6-9
Ethavan Still Residue	50	3
Phthalyl Chloride Residue	8.4	3
Santolite MHP and	10	6-9
Santolite MS-80%		3
Aspirin/Starch Floor Sweepings	12	3
OS-59 Filter Cake	2.2	3
OS-128 Filter Cake	0.6	6-9
OS-140 Filter Cake	2	6-9
DPP Filter Cake	4.8	3
Sant. 8 Regular Filter Cake	10.7	3
Sant. 8 Special Filter Cake	1	3
Phos. Esters (4) Filter Cakes	33.3	6-9
Phos. Esters (4) Filter Cartridges	62.2	6-9
Trimethoxybenzaldehyde Residue	7	3
Lab Solids	78	3
Fumaric Acid Floor Sweepings	26	3
TCC Floor Sweepings	5	3
Sant. 9E Carbon Filter	64	3
p-TSCI Brigs. Reject	10	6-9
HCl Recovery Carbon	8	3

NOTES: 1 - 6-9 months for DOT approval assumes that formal toxicity screening will be required on these residues because of no previous test work. 3 months approval date based on discussion with Medical which indicated available toxicity information would be adequate for the necessary evaluations.

COMMENTS: 1. The preferred disposal method/outlet for these residues is incineration in the St. Louis Area Incinerator CEA-3246. Current plans are for all of the above to be incinerated at this facility.

2. With the exception of the TSCI residue which has been cleared for disposal by Rollins Environmental Services in Baton Rouge, Louisiana, and Nuclear Engineering Company in Sheffield, Illinois, no alternate disposal sites are currently available. NECO and Earthline, Inc. have been informally approached and both indicated no problems with the acceptance of any of these materials.

MCO 0616737

K00021

3. All wastes are presently handled in methods compatible with contract disposal.
4. Timing to move to alternate disposal sites depends largely on the time required to obtain proper shipping authorizations. Clearing of the wastes with alternate disposal outlets is not felt to be the limiting factor.

MCO 0616738

Interview

Mr. Spangler

No records were kept on material going to landfill. Costs were evenly distributed across plant with department avg. as basis.

Price to landfill material was dumped

on the W.G. Kammrich Plant site. 5160/ton

are built on this site. Parking lot is over a

dumped area. P₁, Plant, ODCB were dumped there. Quarry and Research used contract haulers, we used our own chassis and trucks.

8. Misc

Sy haulers hired in Langley. Never

received material from other companies. Never

gave material to an unknown hauler.

MCO 0616739

Mr. Spence

000209

Haganola Waste

Mr. Spence
1. Review actual in Village
from Smith - day operator of landfill
ACR drop 2

According what taken into the landfill

Clark (Rueben) was the first
employees who worked

1. By burial before existing
sanitary landfill

2. ODCB intent to landfill from
Guernsey Rutherford
from North Ave

3. Research buried this unidentified
waste

3. Anticipated site will last 15
years

4. Guernsey & Rue had contract
we need our own haulers

5. Site in plant 3-150/ACU
need to be dumps / please

6. Not F handouts

7. Not creek loaded brought
Building dump of liquid
wastes

NCU 0616741
1429190

to mostly

Subsided trail in forest
Never from the company

Never are material to
a uniform ruler.

Faculty Clayton Church

1970 weighing barrel

No duplicate done. I think—

— the following

"No lead"

'Quartz also in mineral
maybe before 1950'

Memo to file

attached is zerox of information sent to government
on waste streams. Much of the information was obtained
from my files.

MCO 0616743

000212

J. F. QUEENY 1976 WASTE DISPOSAL

		<u>K lbs.</u>	<u>\$K</u>
Incineration	-	2678	254.0
Landfill (Toxic)	-	330	15.5
WGK Landfill	-	6000*	55.9
Trash	-	1274	14.6

* Includes 5.0 Mlbs of fly-ash and clinders

<u>(K+E)</u>	10
<u>II</u>	C
<u>Site R</u>	
#3	

MCO 0616744

K00023

J. F. QUEENY CONTRIBUTION TO W. G. KRUMMRICH LANDFILL

<u>Material Type</u>	<u>K lbs/yr (Est. 1977)</u>
Filter Cakes and Carbons	188.8
Residues	695.4
Off-spec Products	81.0
Lab Solids/Glassware	78.0
Fly-ash and Cinders	<u>5,000.0</u>
	6,043.2

MCO 0616745

K00024

J. F. QUEENY STATUS

1. All J. F. Queeny wastes are handled in methods compatible with contract disposal - no additional project work necessary.
2. Preliminary contacts with disposal outlets indicates no significant problems with their ability to handle these waste materials - either volumes or types.
3. Timing to move to alternate disposal outlets contingent upon obtaining proper shipping authorization through Corporate Distribution - Three to nine months depending on the test data required for toxicity evaluation.
4. Current plans are to incinerate all JFQ wastes currently going to W GK Landfill at the Area Incinerator - CEA-3246.

MCO 0616746

K00025

PROGRESS REPORT

JOHN F. QUEENY PLANT
TECHNICAL SERVICES DEPARTMENT

ESTIMATE NO. *ETA - WORK*
JOB NUMBER
370-E-47
REPORT NUMBER
87
000215
DATE
January 3, 1969

JOHN F. QUEENY PLANT	GENERAL OFFICES	OTHERS
<input type="checkbox"/> L. AYNAUDI <input checked="" type="checkbox"/> D. M. CAMPBELL <input type="checkbox"/> J. D. CLARK <input type="checkbox"/> W. S. COLTER <input type="checkbox"/> F. W. COPANAS <input type="checkbox"/> J. L. CORDER <input checked="" type="checkbox"/> K. H. FRANK <input checked="" type="checkbox"/> P. F. GATENS <input type="checkbox"/> R. A. GEISMAN <input checked="" type="checkbox"/> G. A. HIPPE <input checked="" type="checkbox"/> S. L. JESSEE <input type="checkbox"/> S. O. LYON	<input checked="" type="checkbox"/> D. E. MUNIE <input type="checkbox"/> J. W. PARMETER <input type="checkbox"/> J. E. ROGERS <input checked="" type="checkbox"/> J. R. SAVAGE <input type="checkbox"/> H. L. SCHNEIDER <input checked="" type="checkbox"/> D. C. Malm <input checked="" type="checkbox"/> J. L. SOLARI <input checked="" type="checkbox"/> R. C. SPRAGUE <input checked="" type="checkbox"/> S. L. TILFORD <input checked="" type="checkbox"/> W. J. WILSON <input type="checkbox"/> E. G. WOOD <input checked="" type="checkbox"/> TED FILE	<input type="checkbox"/> D. DANNA (AI) <input type="checkbox"/> N. L. SAMPLE <input type="checkbox"/> R. J. STRATMEYER <input type="checkbox"/> BUSINESS GRP. DIR. <input type="checkbox"/> TECH. PROD. MGR. <input type="checkbox"/> RESEARCH MGR. <input type="checkbox"/> R. E. HOWARD <input type="checkbox"/> J. O. BRIGHT <input checked="" type="checkbox"/> M. E. Batz
		<input type="checkbox"/> T. M. PATRICK <input type="checkbox"/> ENGR. SUPVR. <input type="checkbox"/> J. C. LANDWEHR-ANN <input type="checkbox"/> W. KELLOGG-NITRO <input type="checkbox"/> D. B. EDWARDS <input type="checkbox"/> J. F. WHITE-EVERETT

☒ To Receive Details Section

☐ To Receive Summary Only

TITLE Waste Disposal--Sanitary Land Fill

PERSONNEL: R. T. Harper (J. L. Solari)

PROBLEM Determine quantity, approximate hauling cost, land fill use cost, and possible composition of waste material sent to sanitary land fill.

SUMMARY: During the twelve month period July 1, 1967 to June 30, 1968, the John F. Queeny Plant disposed of 5,878 cubic yards of waste material to the W. G. K. Plant, Sanitary Land Fill. The cost was \$16,227 for hauling charges with land fill use charge of \$18,444 for a total cost of \$34,670.

MCO 0616747

DEPARTMENT	PRODUCT OR BUILDING	CUBIC YARDS	ANNUAL HAULING COST	ANNUAL LAND FILL USE COST
800.18 (A-5)	Nitro Chloro Benzene	1662	\$5296	\$5241.37 <i>Bar</i>
803.85 (62)	DCA; TCC (FF)	1102	3104	3458.25 <i>Bar</i>
808.01 (155)	Interim Production (W)	1044	1875	3181.59 <i>- Bar</i>
803.70 (53)	Benzoic Acid	1005	3240	3181.59 <i>Bar</i>
803.78 (A-9)	Phthalic Anhydride (L)	445	1355	1398.57 <i>- Bar</i>
803.07 (E-5)	Amides (II)	296	530	937.57 <i>Landfill</i>
803.01 (35)	Oil Additives (BB)	101	180	338.14 <i>- Landfill</i>
803.74 (54)	Bisphenol A (CC)	45	80	122.96 <i>Bar</i>
801.73 (55)	TSCl (HHH+yy)	20	65	70.85 <i>- Landfill</i>
803.75 (49)	Maleic Anhydride	18	30	46.11
803.61 (50)	TS Acid (EE)	11	20	30.74 <i>Landfill</i>
802.15	Kalcolor (M)	8	26	30.74 <i>Landfill</i>
	Cyclamates ("DD")	8	26	30.74 <i>Landfill</i>
803.96 (VV)	Central Drumming	6	20	15.37 <i>Bar</i>
760.01	Research Pilot ("WW")	6	10	15.37 <i>Landfill</i>
913.40	Sanitation (Plant)	101	180	338.14 <i>Landfill</i>
TOTALS		5878	\$16,227	\$18,444.30
CONFIDENTIAL INFORMATION				
TOTAL WASTE DISPOSAL COST				\$34,671

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K00010

MCO 0616749

[illegible]

WASTE DISPOSAL - SANIT
--- Characterization

LAND FILL
Waste ---

MCO 0616751

Dept.	Bldg.	Material	Toxicity	Combustible	Ambient Temp.		% Water	Cu. Yds.	Approximate Hauling Cost (Annual)	Annual Landfill Use Cost
					Liquid	Solid				
(E-5) 803.0	II	Para Still Residue	yes	no		100%	0%	225	\$10.00	\$712.55
	II	Iron Sludge	yes	no	±20%	±20%	±20%	36	60.00	112.51
	II	Low Boiler Fractions	yes	no	100%	0%	0%	35	60.00	112.51
(149) 803.75	open and PP	Spent catalyst Vanadium Pentoxide	no	no	--	100%	--	18	30.00	46.11
(54) 803.71	"CC"	90% Bisphenol A 10% Phenol	no	no /		100% yes	trace .1%	45	80.00	122.96
(53) 803.70	open	Benzoic Acid Residue (See below for composition)	yes	partially yes		yes	0%	1005	3240.00	\$181.59
		Benzaldehyde 2%		yes						
		Benzyl Acetate 2%		"						
		2, Methyl Biphenyl 6%		"						
		Biphenyl 3%		"						
		Bibenzyl 6%		"						
		Composition-Laboratory analysis For Benzoic Acid residue								
		Benzoic acid (low grade) + phthalic 17%		no						
		Benzyl Benzoate 35%		no						
		Toluene 9%		yes						
		Non Volatiles 20%		no						

000218

K00013

WASTE DISPOSAL - SANITARY LAND FILL
 --- Characterization Waste ---

MCO 0616752

Dept.	Bldg.	Material	Toxicity	Combustible	Ambient Temp.		% Water	Cu. Yds.	Approximate Hauling Cost (Annual)	Annual Landfill Use Cost
					Liquid	Solid				
760.0 Research "WV" Pilot plant		Cellulose Flour	no	slightly yes		100%	0%	6	\$ 10.00	\$ 15.31
Inter m Product "W" 10x										
808.0	W	Santicizer 856	no	no	100%	1%	.1%	17	30.00	46.11
	W	Santicizer 460	no	no	100%	1%	.1%	8	25.00	30.71
	W	Mother Liquor (PVI) Varsol (keresencut)	no	yes	100%	< 1%	< 1%	408	730.00	1241.90
	W	Press cake (2 filter- ing operations)	no	no		yes	30%	204	360.00	620.00
	W	Sumithion Residue	yes	?		yes	--	102	180.00	310.47
	W	Miscellaneous oils and Organic solvents and side streams	no	yes	yes	--	Trace	305	550.00	931.42
	W						TOTALS	1044	\$1875.00	\$3181.59
							TOTALS FOR PLANT	5878	\$16,227.00	\$18,444.0

K00014

000219

WASTE DISPOSAL - SAN Y LAND FILL
 --- Characterization of Waste ---

MCO 0616750

Dept.	Bldg.	Material	Toxicity	Combustible	Ambient Temp.		% Water	Cu. Yds.	Approximate Hauling Cost (Annual)	Annual Landfill Use Cost
					Liquid	Solid				
Central Drumming 803.98	VV	Aliphatic and aromatic Esters-Plasticizers	no	no ✓	100%		< .1%	6	10.00	15.3
(A-9) 803.70	N	Napthalene Residue	Is not a Problem	yes		100%	0%	112	460.	321.6
803.70	L	1st Fraction from #1 column	"	will burn yes	100%		0%	265	840.00	839.10
803.70	L	Phthalic Residue	"	no /		100%	0%	68	255.00	237.70
AMIDES (55) 801.78	YY	Amides and TSCL	no	no /		100%	--	20	65.00	76.05
Cyclamates 801.91	DD	Old material-cake-and misc. mixture, product no longer made	no	no			--	8	26.00	30.71
Kalcolon 802.15	M	Mixture of carbon; C-4 dry old non spec product and junk	no	no			--	8	26.00	30.71
(50) 801.50	EE	Discarded off specification Toluene Sulfonic Acid	no	no		semi-solid	2% +	11	20.00	30.71
									000217	

800012

PROGRESS REPORT

TECHNICAL SERVICES DEPT. - W. G. KRUMRICH PLANT

JOB NO.

91341:9002

REPORT NO.

2

AUG 20 1970

DATE

8 / 6 /

W.S. KRUMRICH PLANT		RESEARCH	GENERAL OFFICE	OTHERS
<input checked="" type="checkbox"/> E.R. Billen	<input checked="" type="checkbox"/> C. Mason	<input type="checkbox"/> G.O.	<input type="checkbox"/> J. E. Smith	<input checked="" type="checkbox"/> J. R ^{MR} Sava
<input checked="" type="checkbox"/> J.C. Hume	<input checked="" type="checkbox"/> M.J. Beaudine	<input type="checkbox"/> J. O. Bright	<input type="checkbox"/> B. DANNA	<input type="checkbox"/> W. R. KELLOGG SITING ASSISTANT
<input checked="" type="checkbox"/> A. E. Leisy	<input checked="" type="checkbox"/> C.N. Deubner	<input type="checkbox"/> W.R. Richard	<input type="checkbox"/> D. E. Cayard	<input type="checkbox"/> J.C. Landow
<input checked="" type="checkbox"/> T. W. DALTON	<input checked="" type="checkbox"/> T.E. Greenman	<input type="checkbox"/> C. E. ANAGNOSTOPOULOS	<input type="checkbox"/> P. W. EDWARDS	<input type="checkbox"/> So. 2nd St
<input checked="" type="checkbox"/> E.H. Kimball	<input checked="" type="checkbox"/> W.C. Engman	<input checked="" type="checkbox"/> P.B. Hodges	<input type="checkbox"/> R. E. Howard	<input type="checkbox"/> P.O. DeGarn
<input checked="" type="checkbox"/> G. L. Bratsch	<input checked="" type="checkbox"/> S. Jackson	<input type="checkbox"/>	<input type="checkbox"/> A. A. HEMINGER	<input type="checkbox"/> T.M. Patri
<input type="checkbox"/> D. J. O'Toole	<input checked="" type="checkbox"/> D.C. Armstrong	<input type="checkbox"/>	<input checked="" type="checkbox"/> D. B. NORMER	<input type="checkbox"/> J.F. Quinn
<input checked="" type="checkbox"/> D. W. Jackson	<input checked="" type="checkbox"/> H.B. Patrick	<input type="checkbox"/>	<input type="checkbox"/> H. C. Carder	<input type="checkbox"/>
<input checked="" type="checkbox"/> B.R. Williams	<input checked="" type="checkbox"/> G.C. Vincent	<input type="checkbox"/>	<input type="checkbox"/> M. L. SAMPLE	<input checked="" type="checkbox"/> M. E. Batz-CE
<input checked="" type="checkbox"/> J. Smith	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TO RECEIVE DETAIL SECTION

TITLE:

W.G.K. Solids Waste Disposal - 1969

PERSONNEL:

M. Pierle (C. F. Buckley)

PROBLEM:

Determine volume and disposal costs of all W.G.K. solid chemical wastes disposed of at the W.G.K. landfill.

SUMMARY

During 1969, the following quantities of solid waste were disposed at the Village and Monsanto landfill for a total cost of \$94,000 (\$54,000 hauling and \$40,000 landfill operation):

	#/YR.
1) In drums	757,200
2) In dumpster boxes	9,024,500
3) In trailers and dempster tanks	35,869,100
	45,650,800

The landfill operation figures include that for trash disposal. Hauling costs for trash are not included.

MCO 0616753

pd

M. Pierle

K 02030

TSD

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Job No. 91341:9002 (Report No. 2)

Page 2

8/6/70

DETAILS

A. Table 1 details the composition and volume of solid waste generated at W.G.K. and disposed at the Village and Monsanto landfills.

TABLE 1VOLUME OF SOLID WASTES

DEPT.	MATERIAL	IN TRAILERS/TANKS PPY	IN DEMPSTER BOXES PPY	IN DRUM: PPY
237	~10% Cl ₂ OH			
236	Residue	2,920,000		
	Spent caustic	2,807,240		
	Spent acid	1,910,570		
	Cl ₂ OH			39,600
221	Chlorinated benzene	4,213,640		
262	Cl ₂ OH, H ₂ SO ₄ , CH ₃ COOH	1,939,050		
248	H ₂ O, cresol, phenol	3,307,390		
266		7,780		
275	Maleic Anhydride	520,020		
273	ODCB, TCB, ONCB	262,700		
247	Para-phenetidine residue	188,040		275,000
270	Methanol, Oil	709,850		
Rip Trk	H ₂ O, OH, Aroclor	930,750		
258	H ₂ O, OH, PSA	1,134,140		
	Filteraid		1,000,000	
	BaO, BaCO ₃ , CaCO ₃		500,000	
	#5 Oil, BABS, ABSA		1,000,000	
250	50% P, 50% H ₂ O			25,000
255	NDPA residue	2,554,360		
239	PCP, BzCl	634,510		
	Aroclor			5,000
270	Filter Aid		1,900,000	
	Ca Solids		950,000	
	#5 Oil, S-290C, S-291		1,900,000	
266	Filter Aid		200,000	
	Zn O		150,000	
	#5 Oil, S-393, 493, 593		200,000	
	18% P ₂ S ₅ , 4.5% thio acid			
	77.5% H ₂ O			9,900
232	10-30% Gypsum		792,000 dry wt.	
245	P ₂ S ₅			5,000
283	Contaminated #5 oil			13,000
254	Recovered phenol			55,000
	TPP			11,000
	ONCB, NaOH, H ₂ O			5,500
223	18% Santosite	2,000,000		
	50% H ₂ O, 50% OH Residue	8,580,000		
	Fusion mass & washings	1,248,880		
200	Montar			180,000
	Scrap Aroclor			120,000

MCD 0616755

K 02031

Job No. 91341:9002 (Report No. 2)

Page 3

8/6/70

TABLE 1 - VOLUME OF SOLID WASTES (continued)

DEPT.	MATERIAL	IN TRAILERS/TANKS PPY	IN DEMPSTER BOXES PPY	IN DRUM. PPY
233	FeCl ₃ , S, Cl-benzene		60,000	
224	M-DCE, TCB		110,000	
222	Ca (OH) ₂ , celite ONA residue		262,500	13,200
		35,869,100	9,024,500	757,200

- B. The cost for hauling and disposal at the Village and Monsanto landfill are given in Table 2.

TABLE 2

MCO 0616756

COST OF SOLID WASTE DISPOSAL

	<u>\$/YEAR</u>
Hauling - Trailers @ 11¢/cwt.	24,000
Dempster Tanks, Boxes and Drums	40,000
Landfill - Liquid and Drums	30,000
Dempster Boxes and Trash	10,000
	\$94,000

K 02032

EPA Notification of Hazardous Waste Site

Environmental Protection
Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

000223

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name Monsanto Co. - J. F. Queeny Plant
Street 1700 South Second Street
City St. Louis State Missouri Zip Code 63177

B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site W. G. Krummrich Landfill
Street Route 3
City Sauget County St. Clair State Illinois Zip Code 62201

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title) McCombs, Max W. - Env. Prot. Supv.
Phone (314) 622-1400

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year) Unknown To (Year) 1977

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☒ Organics
2. ☒ Inorganics
3. ☒ Solvents
4. ☒ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☒ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 30 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

MCO 0616757

F Waste Quantity: Place an X in the appropriate boxes to indicate the facility types found at the site. In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons. In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.	Facility Type 1. <input type="checkbox"/> Piles 2. <input type="checkbox"/> Land Treatment 3. <input checked="" type="checkbox"/> Landfill 4. <input type="checkbox"/> Tanks 5. <input type="checkbox"/> Impoundment 6. <input type="checkbox"/> Underground Injection 7. <input type="checkbox"/> Drums, Above Ground 8. <input checked="" type="checkbox"/> Drums, Below Ground 9. <input type="checkbox"/> Other (Specify) _____	Total Facility Waste Amount cubic feet <u>178,000</u> gallons _____ Total Facility Area <u>000224</u> square feet _____ acres <u>36</u>
--	---	--

G Known, Suspected or Likely Releases to the Environment:
 Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☐ Non
☒ Do not know

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)
 Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

I Description of Site: (Optional)
 Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

MCO 0616759

J Signature and Title:
 The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required

Name <u>George Knollmeyer, Plant Manager</u> Street _____ City _____ State _____ Zip Code _____ Signature _____	804 <input type="checkbox"/> Owner, Present <input type="checkbox"/> Owner, Past <input checked="" type="checkbox"/> Transporter <input type="checkbox"/> Operator, Present <input type="checkbox"/> Operator, Past <input type="checkbox"/> Other
--	--

Date 5/18/81

DATA MULTIPLICATION OF HAZARDOUS WASTE SITE

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

000225

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name Monsanto Co. - J. F. Queeny Plant

Street 1700 South Second Street

City St. Louis

Stone Missouri 2nd Cont 63177

B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site Sauget (Monsanto), Illinois Landfill

Street Falling Springs Road

CITY **Sauget** COUNTY **St. Clair** STATE **Illinois** ZIP CODE **62201**

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title) McCombs, Max W. - Env. Prot. Supv.

Phone (314) 622-1400

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site

From (Year) Unknown To (Year) 1957

Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item 1—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

Source of Waste:
Place an X in the appropriate boxes.

1. ☒ Organics
2. ☒ Inorganics
3. ☒ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☒ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☐ Other (Specify)

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 30X regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

[illegible]

MCO 0616760

F Waste Quantity: Place an X in the appropriate boxes to indicate the facility types found at the site. In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons. In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.	Facility Type 1. <input type="checkbox"/> Piles 2. <input type="checkbox"/> Land Treatment 3. <input checked="" type="checkbox"/> Landfill 4. <input type="checkbox"/> Tanks 5. <input type="checkbox"/> Impoundment 6. <input type="checkbox"/> Underground Injection 7. <input type="checkbox"/> Drums, Above Ground 8. <input checked="" type="checkbox"/> Drums, Below Ground 9. <input type="checkbox"/> Other (Specify) _____	Total Facility Waste Amount cubic feet: <u>356,000</u> gallons: _____ Total Facility Area <u>000226</u> square feet: _____ acres: <u>Unknown</u>
--	---	---

G Known, Suspected or Likely Releases to the Environment:
 Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☐ Likely ☐ None
☒ Do not know

Note: Items Hand I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

MCO 0616761

I Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address item A). For other persons providing justification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".

Name George F. Knollmeyer, Plant Manager
 Street _____
 City _____ State _____ Zip Code _____
 Signature _____ Date 5/18/81

JOS

☐ Owner, Present
☐ Owner, Past
☒ Transporter
☐ Operator, Present
☐ Operator, Past
☐ Other

Monsanto

000227

FROM: NAME & LOCATION

J. F. Nemeth - J. F. Queeny Plant

April 3, 1974

cc P. B. Hodges - EISF
D. C. Malm
A. E. Peterson
R. L. Harness - MCK
R. L. Wiese

SUBJECT J. F. QUEENY PLANT WASTES FOR DISPOSAL
IN LANDFILL AT SAUGET, ILLINOIS

REFERENCE

TO : J. T. Garrett - A2SA
C. D. Bohi - A2SA

The attached sheets show what wastes are presently landfilled,
and what we propose to continue to landfill after July 1974.

About a month ago you gave approval by telephone to continue
disposal of these wastes in the Sauget landfill.

Will you kindly review this list and give us your written
approval.

J. F. Nemeth

J. F. Nemeth

:mjl

K+E

#15
C

II

S&R

#3

MCO 0616762

K 02044

1. F. QUEENY PLANT WASTES FOR LA

FILL - SAUGET

J.F.N. H.

MA. CRIAL	COMPOSITION	%	AMBIENT CONDITION	MELT PT	HAULING METHOD	VOLUME LBS. / YEAR	COMMENTS
310 Phenacetin Still Residue	Phenacetin Organic Tars p-chloroacetanilid	30 60 10	chocolate crystalline solid	50°C	44 Gal. LVP	100000	MCO 0616763
316 Methyl Salicylate Still Residue	Methyl Salicylate Organic Tars 4-Hydroxy Isophthalate	40 20 40	black tarry residue	80°C	55 Gal. Cans with sealed bungs	10000	
319 Aspirin Powder	Aspirin Starch	50 50	white powder	-	44 Gal. LVP	12000	
135 TSCI Residue	Sulphones Toluene Sulfonyl chloride	85 15	black residue	55°C	55 Gal. Cans	566000	
136 Tech. Amides	p-toluenesulfonamide	60 40	brown-black residue	100°C	55 Gal. Cans	18000	
143 Filter Cake	Carbon Methyl Alcohol	98 2	black mass	-	55 Gal. Cans	36500	
154 Ethavan Still Residue	Iso-ethavan Ethavan Dialdehyde Org. Tars	20 30 50	tarry residue	135°C	55 Gal. Cans	33000	
163 Phthalylchloride Still Residue	ZnCl ₂ Extruded. Phthalyl Chloride Fractions	16.7 83.3	black viscous tar	150°C	55 Gal. Cans	25000	
63 Filter Cake	Dimers Dimer 255/0 Catalyst Dicalite	50 40 10	brown filter cake	-	55 Gal. Cans	9400	
63 OS-59 Cake	OS-59 Carbon Activated Alumina Solka Flocc	50 20 20 10	black oily filter cake	-	55 Gal. Cans	2200	
63 OS-12B Cake	OS-12B Carbon Solka Flocc Sod. Methylate	50 32 16 2	black oily filter cake	-	55 Gal. Cans	600	

000228

J.F. QUEENY PLANT WASTES FOR L. DRILL - SAUGET

J.F. Queeny

N. KIAL	COMPOSITION	AMBIENT	CONDITION	MELT PT.	HAULING METHOD	VOLUME LBS./YDAR	COMMENTS
163	OS-140 Cake	50 32 16 2	black oily filter cake	-	55 Gal. Cans	2 000	
163	OS-152 Cake	50 17 16 7	black oily filter cake	-	55 Gal. Can	3 00	
164	Diphenyl Phthalate	50 50	reddish-brown to grey filter cake	-	44 Gal. LVR	15 800	
166	Santizer 1-H Filter cake	50 48 2	black filter cake	-	30 Gal. Drums	700	
166	Santizer 8 Filter cake	50 48 2	grey to black filter cake	-	30 Gal. Drums	7500	
166	Sant. 8 Spec. Filter cake	50 48 2	black filter cake	-	30 Gal. Drums	3200	
173	Benzoic Residue	80 20	brown flake solid	125°C	55 Gal. Drums	4400	
175	Maleic Catalyst	87 9 4	greenish solid particles	-	50 Gal. Drums	88000	
89 803	MP-HCl Residue	10 70 20	dark tarry residue	150°C	55 Gal. Drums	2500	

00002229

MCO 0616764

J. F. QUEENY PLANT WASTES FOR YD FILL - SAWGET

J. F. Nemeth

SERIAL	COMPOSITION	%	ANALY. CONDITION	MELT. PT.	HAULING METHOD	VOLUME LBS./YEAR
389 1813	MP Fumarate Residue	10 70 20	dark tarry residue	150°C	55 Gal. drum	500
389 1030	TMB Residue Polyethylene glycol Trimethoxy benzaldehyde	50 50	black tarry residue	110°C	55 Gal. cans	7000
389 888	Santolite MHP or MS	100	black hard resin	80°C	7 Gal. cans	20000
Total						96400

K 02047

MCO 0616765

000230

WCO 0616766

[

E

APPENDIX E
Index of Documents

Forms B and C of Eckhardt Survey for Queeny Plant (000231 to
000236)

MCO 0616767

FORM OF HAULER INFORMATION

(1-5)
(DO NOT USE)

PROVIDE A COMPLETE LIST OF ALL FIRMS AND INDEPENDENT CONTRACTORS, INCLUDING THE COMPANY AND ITS AFFILIATES AND SUBSIDIARIES, USED TO REMOVE PROCESS WASTES FROM THIS FACILITY SINCE 1950.

000231

Company Name: Monsanto Company

Facility Name: John F. Queeny Plant

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used
KIES, Inc.	P. O. Box 745 Wichita, Kansas 67201	Unknown	1978 - Present
NECO, Inc.	P. O. Box 158 Sheffield, Illinois 61356	Unknown	1975 - Present
Matlack Trucking, Inc.	10 West Baltimore Avenue Landsdown, Pennsylvania 19050	Unknown	1974 - Present
Rollins Environmental Services, (TX), Inc.	P. O. Box 609 Deer Park, Texas 77536	Unknown	1974 - Present
Rollins Environmental Services, (LA), Inc.	P. O. Box 70807 Baton Rouge, Louisiana 70807	Unknown	1974 - Present
W. Jordan	3910 Evans St. Louis, Missouri 63113	Unknown	1955 - 1977
Ray Walter, Jr.	726 Foster Drive Arnold, Missouri 63019	Unknown	1950 - 1977
Gordon Transport, Inc.	7337 Hall Street St. Louis, Missouri 63147	Unknown	1974
Central Express, Inc.	P. O. Box 4325 Corpus Christi, Texas 78408	Unknown	1974
Missouri Pacific Railroad/ Truck Lines	824 S. Vandeventer St. Louis, Missouri 63110	Unknown	1975
Bea Line Trucking Company	P. O. Box 1353 St. Louis, Missouri 63188	Unknown	1975
Checker Express Operating Nighthawk	6801 South 13th Street Milwaukee, Wisconsin 53221	Unknown	1974 - 1976
Slay Transportation Company, Inc.	P. O. Box 1353 St. Louis, Missouri 63188	Unknown	1975 - 1976
Monsanto Company J. F. Queeny Plant	1700 South Second Street St. Louis, Missouri 63177	Unknown	1950 - 1957
Oscar F. Walter	646 Weber Road St. Louis, Missouri 63125	Unknown	1950 - 1958

MCO 0616768

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

000232

Company Name: Monsanto Company
Facility Name: John F. Queeny Plant
Name of Site: Monsanto (Sanger) Illinois Chemical
Address of Site:

no. street
Monsanto (Sanger) IL. 62261
city state zip code

Name of Owner (while used by facility): Unknown
Address:

no. street
city state zip code

Current Owner (if different from above): Unknown
Address:

no. street
city state zip code

1. Location (1= the property on which facility is located; 2= off-site)..... ☒ (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ☒ (11)
3. Current status (1= closed; 2= still in use; 3=don't know) ☒ (12)
IF CLOSED, specify year closed 1975 (13-14)
4. Year first used for process waste from this facility 1950 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) 1975 (17-18)
6. Total amount of process waste from this facility disposed at site:
thousand gallons (19-26)
hundred tons (27-33)
thousand cubic yards (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
landfill, none industrial waste ☒ (42)
landfill, mixed industrial waste ☒ (43)
landfill, drummed waste ☒ (44)
landfill, municipal refuse co-disposed ... ☒ (45)
pits/ponds/lagoons ☒ (46)
deep well injection ☒ (47)
land farming ☒ (48)
incineration ☒ (49)
treatment (eg. neutralizing) ☒ (50)
reprocessing/recycle ☒ (51)
other (specify) ☒ (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ☒ (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

x - Don't know.

MCO 0616770

PCRY B - Page 2

Company Name: Monsanto Company

Facility Name: John P. Queeny Plant

Site Name: Monsanto (Gauger) Illinois Landfill

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

000231

9. Components (or characteristics) of process waste from this facility disposed at site: (1-present in waste; 2-not present in waste; 3-don't know)

FILL IN EVERY BLOCK SPACE

Acid solutions, with pH < 3	(10)
pickling liquor	(11)
metal plating waste	(12)
circuit etchings	(13)
inorganic acid manufacture	(14)
organic acid manufacture	(15)
Base solutions, with pH > 12	(16)
caustic soda manufacture	(17)
nylon and similar polymer generation	(18)
scrubber residual	(19)
Heavy metals & trace metals (bonded organically & inorganically)	(20)
arsenic, selenium, antimony	(21)
mercury	(22)
iron, manganese, magnesium	(23)
zinc, cadmium, copper, chromium (trivalent)	(24)
chromium (hexavalent)	(25)
lead	(26)
Radioactive residues, > 5 pCi curies/liter	(27)
uranium residuals & residuals for U ₆ recycling	(28)
lanthanide series elements and rare earth salts	(29)
phosphate slag	(30)
thorium	(31)
radium	(32)
other alpha, beta & gamma emitters	(33)
Organics	(34)
pesticides & intermediates	(35)
herbicides & intermediates	(36)
fungicides & intermediates	(37)
rodenticides & intermediates	(38)
halogenated aliphatics	(39)
halogenated aromatics	(40)
acrylates & latex emulsions	(41)
PCB/PPB's	(42)
amides, amines, imides	(43)
plastisers	(44)
resins	(45)
elastomers	(46)
solvents polar (except water)	(47)
carbon tetrachloride	(48)
trichloroethylene	(49)
other solvents nonpolar	(50)
solvents halogenated aliphatic	(51)
solvents halogenated aromatic	(52)
oils and oil sludges	(53)
esters and ethers	(54)
alcohols	(55)
ketones & aldehydes	(56)
dioxins	(57)
Inorganics	(58)
salts	(59)
mercaptans	(60)
Misc.	(61)
pharmaceutical wastes	(62)
paints & pigments	(63)
catalysts (eg. vanadium, platinum, palladium)	(64)
asbestos	(65)
shock sensitive wastes (eg. nitrated toluenes)	(66)
air water reactive wastes (eg. P ₂ , aluminum chloride)	(67)
wastes with flash point below 100° F.	(68)

MCO 0616771

FORM B: DISPOSAL SITE INFORMATION

(1-3)
(DO NOT USE)

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

000234

Company Name: Monsanto Company
Facility Name: John F. Queeny Plant
Name of Site: HXK Landfill
Address of Site:
no. street
Sauget, IL. 62201
city state zip code
Name of Owner (while used by facility): Monsanto Company
Address:
no. street
city state zip code
Current Owner (if different from above):
Address:
no. street
city state zip code

1. Location (1= the property on which facility is located; 2= off-site)..... ☒ (10)
2. Ownership at time of use (1= company ownership; 2= private but not company ownership) 3= public ownership) ☐ (11)
3. Current status (1= closed; 2= still in use; 3= don't know) ☐ (12)
- IF CLOSED, specify year closed 1971 (13-14)
4. Year first used for process waste from this facility 1957 (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) 1971 (17-18)
6. Total amount of process waste from this facility disposed at site:
thousand gallons ☐ (19-26)
hundred tons ☐ (27-33)
thousand cubic yards ☐ (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1= currently in use; 2= no longer in use; 3= never used; 9= don't know)
landfill, mono industrial waste ☒ (42)
landfill, mixed industrial waste ☐ (43)
landfill, drummed waste ☐ (44)
landfill, municipal refuse co-disposed ... ☐ (45)
pits/ponds/lagoons ☐ (46)
deep well injection ☐ (47)
land farming ☐ (48)
incineration ☐ (49)
treatment (eg. neutralizing)..... ☐ (50)
reprocessing/recycling ☐ (51)
other (specify) ☐ (52)
8. Users of this site (1= this facility; 2= this facility and other company facilities only; 3= this company and others; 9= don't know) ☒ (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

Monsanto Co.
W. G. Krumrich Plant
Sauget, Illinois

MCO 0616772

Company Name: Monsanto Company

Facility Name: John F. Guerry Plant

Site Name: WCK Landfill

000235

9. Comments (or characteristics) of process waste from this facility disposed at site: (1-present in waste, 2-not present in waste; 3-don't know)

FILL IN EVERY BLOCK SPACE

Acid solutions, with pH < 3	(10)
pickling liquor	(11)
metal plating waste	(12)
circuit etchings	(13)
inorganic acid manufacture	(14)
organic acid manufacture	(15)
Base solutions, with pH > 12	(16)
caustic soda manufacture	(17)
nylon and similar polymer generation	(18)
scrubber residual	(19)
Heavy metals & trace metals (bonded organically & inorganically)	(20)
arsenic, selenium, antimony	(21)
mercury	(22)
iron, manganese, magnesium	(23)
zinc, cadmium, copper, chromium (trivalent)	(24)
chromium (hexavalent)	(25)
lead	(26)
Radioactive residues, > 2000 curies/1000 lbs	(27)
uranium residuals & residuals for UF ₆ recycling	(28)
lanthanide series elements and rare earth salts	(29)
phosphate slag	(30)
thorium	(31)
radium	(32)
other alpha, beta & gamma emitters	(33)
Organics	(34)
pesticides & intermediates	(35)
herbicides & intermediates	(36)
fungicides & intermediates	(37)
rodenticides & intermediates	(38)
halogenated aliphatics	(39)
halogenated aromatics	(40)
acrylates & latex emulsions	(41)
PCB/PBS's	(42)
amides, amines, imides	(43)
plastisols	(44)
resins	(45)
elastomers	(46)
solvents polar (except water)	(47)
carbon tetrachloride	(48)
trichloroethylene	(49)
other solvents nonpolar	(50)
solvents halogenated aliphatic	(51)
solvents halogenated aromatic	(52)
oils and oil sludges	(53)
esters and ethers	(54)
alcohols	(55)
ketones & aldehydes	(56)
dioxins	(57)
Inorganics	(58)
salts	(59)
mercaptans	(60)
Misc.	(61)
pharmaceutical wastes	(62)
paints & pigments	(63)
catalysts (eg. vanadium, platinum, palladium)	(64)
asbestos	(65)
shock sensitive wastes (eg. nitrated toluenes)	(66)
air water reactive wastes (eg. P ₂ , aluminum chloride)	(67)
wastes with flash point below 100° F.	(68)

MCO 0616773

000236

M. W. McCombs

6/15/79

Assumptions used in completing Waste Disposal Site Survey:

1. Form B (6) - 1979 lbs not included in total.
2. Form B (7) - "LF, Mono Industrial Waste" was 3 unless a site as to handle only one waste.
3. Form B (8) - R. Sinese, WCK, contacted Rollins and NECO and they did not want to release customer names, therefore, none have been reported for any facility.
4. Form B (4) - If disposal site was used prior to 1950, 1950 was entered since survey begins with 1950.
5. Form D - Was not completed since it could not be determined that any haulers took wastes to an unknown location.
6. A separate survey form was not used for each person interviewed.

MCO 0616774

F

]

MCO 0616775

APPENDIX F

Index of Documents

Site R

Generator profile sheet dated 9/19/89 (000237 to 000238)

Chemical data sheet dated 6/29/81 (000239 to 000242)

Site Q

Report dated 12/12/85 re boiler ash test results (000243 to 000249)

Memo dated 7/13/89 re boiler ash EPTOX results (000250 to 000252)



Waste Profile Sheet Code

CWM Location of Original:

(Shaded Areas for CWM Use Only)

CWM Sales Rep. #:

A. GENERAL INFORMATION

1. Generator Name: Monksanto Co. 2. Generator USEPA ID: MDP004954111
3. Facility Address: 1700 South Second Street 4. Generator State ID: IL9291890006
St. Louis, MO 63177
5. Zip Code: _____
6. Technical Contact: Rich Koenig 7. Title: Sr. Env Tech 8. Phone: (314) 622-1469

B. MAIL CHEMICAL WASTE MANAGEMENT, INC. INVOICES TO ☒ Generating Facility (A. above), or

2. Company Name. _____ 3. Phone: () _____

4. Address. _____

5. Zip Code:

C. 1. NAME OF WASTE Fly ash

2 PROCESS GENERATING WASTE Coal Fired Boiler

3 Is this waste a Dioxin listed waste as defined in 40 CFR 261.31 (e.g., F020, F021, F022, F023, F026, F027, or F028)?
☐ Yes ☒ No If yes, **DO NOT COMPLETE** this form. Contact your Chemical Waste Management, Inc. sales representative for assistance.

D. PHYSICAL CHARACTERISTICS OF WASTE

1. Color <u>Black</u>	2. Does the waste have a strong incidental odor? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If known, describe _____	3. Physical State @ 70°F: <input type="checkbox"/> Solid <input type="checkbox"/> Semi-Solid <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Powder Other: _____	4. Layers: <input type="checkbox"/> Multilayered <input type="checkbox"/> Bi-layered <input checked="" type="checkbox"/> Single Phased	5. Specific Gravity: Range: <u>NA</u> - _____	6. Free Liquids: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Volume: _____ %
--------------------------	--	---	---	--	--

7. pH. ☐ ≤ 2 ☐ $> 2-4$ ☐ 4-7 ☐ 7 ☐ 7-10 ☐ 10- < 12.5 ☐ ≥ 12.5 ☐ Range _____ ☒ NA

8. Liquid Flash Point: ☐ < 73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☐ ≥ 200°F ☒ None ☐ Closed Cup ☐ Open Cup

E. CHEMICAL COMPOSITION

[illegible]

Please note: The chemical composition total in the maximum column must be greater than or equal to 100%. T

2. Indicate if this waste contains any of the following:

	NONE	or	LESS THAN	or	ACTUAL	
PCB's	<input type="checkbox"/>		<input type="checkbox"/> <	50 ppm	<u>NA</u>	ppm
Cyanides	<input type="checkbox"/>		<input type="checkbox"/> <	50 ppm	<u>NA</u>	ppm
Phenolics	<input type="checkbox"/>		<input type="checkbox"/> <	50 ppm	<u>NA</u>	ppm
Sulfides	<input type="checkbox"/>		<input type="checkbox"/> <	50 ppm	<u>NA</u>	ppm

F. METALS Indicate if this waste contains any of the following:

1. <input type="checkbox"/> EP TOX/TCLP		or	2. <input type="checkbox"/> Total	
METAL	LESS THAN	or	ACTUAL	
(Parts Per Million)				
Arsenic	<input type="checkbox"/> < 5	<input type="checkbox"/> < 500		NA
Barium	<input type="checkbox"/> < 100			NA
Cadmium	<input type="checkbox"/> < 1	<input type="checkbox"/> < 100		NA
Chromium	<input type="checkbox"/> < 5			NA
Lead	<input type="checkbox"/> < 5	<input type="checkbox"/> < 500		NA
Mercury	<input type="checkbox"/> < 0.2	<input type="checkbox"/> < 20		NA
Selenium	<input type="checkbox"/> < 1	<input type="checkbox"/> < 100		NA
Silver	<input type="checkbox"/> < 5			NA
Chromium-Hex	<input type="checkbox"/> < 5	<input type="checkbox"/> < 500		NA
Copper	<input type="checkbox"/> < 5			NA
Nickel	<input type="checkbox"/> < 5	<input type="checkbox"/> < 134		NA
Thallium	<input type="checkbox"/> < 5	<input type="checkbox"/> < 130		NA
Zinc	<input type="checkbox"/> < 5			NA

MCD 0616777

GENERATOR'S WASTE MATERIAL PROFILE SHEET (Continued) 000238

J80422

Waste Profile Sheet Code

G. OTHER HAZARDOUS CHARACTERISTICS

1. Is this waste a listed solvent waste as defined by 40 CFR 261.31 (F001, F002, F003, F004, or F005)? ☐ Yes ☒ No
2. Does this waste contain greater than 1000 ppm total halogenated organic compounds? ☐ Yes ☒ No
3. Indicate if this waste is any of the following:

- ☐ RCRA Reactive ☐ Radioactive
- ☐ Water Reactive ☐ Etiological
- ☐ Explosive ☐ Pesticide Manufacturing Waste
- ☐ Shock Sensitive ☐ Other _____
- ☐ Pyrophoric ☒ None of the above

H. COMPLETE ONLY FOR WASTES INTENDED FOR FUELS or INCINERATION

	LESS THAN	or	ACTUAL
Beryllium	<input type="checkbox"/> < 5000 ppm		<u>NA</u> ppm
Potassium	<input type="checkbox"/> < 5000 ppm		<u>NA</u> ppm
Sodium	<input type="checkbox"/> < 5000 ppm		<u>NA</u> ppm
Total Bromine	<input type="checkbox"/> < 2 %		<u>NA</u> %
Total Chlorine	<input type="checkbox"/> < 35 %		<u>NA</u> %
Total Fluorine	<input type="checkbox"/> < 1 %		<u>NA</u> %
Total Sulfur			<u>NA</u> %

I. OPTIONAL — RECLAMATION, FUELS, OR INCINERATION PARAMETERS Provide if information is available.

- Range
1. Heat Value (BTU/lb): NA 2. Water: NA %
3. Viscosity (cps): NA @ ☐ °F ☐ 100°F ☐ 150°F
4. Ash: NA % 5. Settleable solids: NA %
6. Vapor Pressure @ STP (mm/Hg): NA
7. Is this waste a pumpable liquid? ☐ Yes ☒ No
- Type of pump? NA
8. Can this waste be heated to improve flow? ☐ Yes ☐ No NA
9. Is this waste soluble in water? ☐ Yes ☐ No NA
10. Particle size: Will the solid portion of this waste pass through a 1/8 inch screen? ☐ Yes ☐ No NA

TRANSPORTATION INFORMATION

1. Is this a DOT Hazardous Material? ☐ Yes ☒ No 2. Anticipated Annual Volume/Units: 2,500,000 / lbs
3. Proper Shipping Name: Chemical Plant Waste, N.D.S.
4. Hazard Class: none 5. I.D. #: none
6. Additional Description: _____
7. Method of Shipment: ☐ Bulk Liquid ☒ Bulk Solid ☐ Drum (Type/Size): _____ Other: _____
8. CERCLA Reportable Quantity (RQ): none 9. RQ Units (lb/kg): _____
10. USEPA Hazardous Waste? ☐ Yes ☒ No 11. USEPA Hazardous Waste Number(s): _____
12. State Hazardous Waste? ☐ Yes ☒ No 13. State Hazardous Waste Number(s): _____

K. SPECIAL HANDLING INFORMATION

MCO 0616779

☐ Additional Page(s) Attached

L. GENERATOR CERTIFICATION I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste material, and all relevant information regarding known or suspected hazards in the possession of the generator has been disclosed.

1. Richard L. Koenig Signature
2. Sr. Env. Tech. Title
3. Richard L. Koenig Name (Type or Print)
4. 9/22/89 Date

GENERAL INFORMATION:

000239

Any Name Monsanto Co

RES Stream No. BR-1386

Plant Address 1700 South Second St

Mailing Address Same

State St. Louis, Mo 63177

State Zip

Company Contact, Technical Rich Koenig

Phone 314-622-1469

Company Contact, Business Neil Prange

Phone 314-622-1467

USEPA Generator I.D. No. MOD004954111

State Generator I.D. No. MO-01002

GENERAL WASTE DESCRIPTION:

AZO Residue

Type of Process Generating Waste: Residue From Distillation Process

Quantity Generated (per mo.) 5,000 #

Frequency (of removal) Inter-plant

TRANSPORTATION INFORMATION:

Hazardous Material: POISON B, Liquid, N.O.S.

Hazardous Substances	Concentration	Hazardous Substances	Concentration
Formaldehyde	1.5%	-	

Hazardous Characteristics: POISON B, Liquid

Transporter: RES

Placarding POISON

TRANSPORTATION EQUIPMENT:

Tank Truck ☒ Vacuum Truck ☐ Flatbed ☐ Dump Truck ☐
Bin ☐ Barge ☐ Tank Car ☐ Other ☐

Method of Collection:

Fiberpaks ☐ Drums ☐ Tanks ☐ Sumps ☐ Other ☐

Other available transportation information:

WCK CAN BE LOADED FROM 8:00 AM - 2:00 PM ONLY

MCO 0616780

WASTE DESCRIPTION AND REGULATORY COMPLIANCE:

000240

Characterization Codes

U122

Reason for above characterization:

State Characterization Codes NO WASTE ID#1

OSHA: Contain listed compounds? No

EPA: PCB conc > 50 ppm? No

NRC: Radioactive? No

PHS: Infectious Wastes? No

FIFRA: Does this waste contain a pesticide for which the EPA has issued specific disposal requirements?

No

CHEMICAL COMPOSITION:

Compound Name	Norm. Conc. Range % W	Chemical Formula
TEA SALT OF S-593	55-60	
2,6 DIETHYLPHENYL AZOMETHINE	20-25	
2,6 DIETHYLANILINE	5-10	$(C_2H_5)_2NC_6H_5$
FORMALDEHYDE	1-5	HCHO
ROSENE AS A DILUTANT	0-15	
TEA SALT is Triethylamine Salt of 2,6-diethylphenyl phosphorothioate		

LABORATORY ANALYSIS

PHYSICAL PROPERTIES

Metals			CN			Mg/L			PHYSICAL STATE @ 25°C			BTU		
Pb	4.001	Mg/L	TOC						GAS	LIQUID	X	ASH	16,000	/lb
Hg	4.01ppm	Mg/L	COD						SOLID	SLUDGE		VAPOR PRESS	10	%
Cd	2	Mg/L	BOD						SLURRY	PASTE				
Be	5	Mg/L	SS						GRANULAR	CRYSTAL		SPEC. GRAVITY	1.067	
As	5	Mg/L	TDS						POLYMERIC	AMORPHOUS				
Na/K		Mg/L	Br									MELTING PT		
Other		Mg/L	Cl	22ppm	% Wt				SINGLE PHASE	X		BOILING PT	245°C	
		Mg/L	F		% Wt				MULTI PHASE			pH	4.8	
		Mg/L	I		% Wt				OIL/WATER			FLASH PT	144°F	
		Mg/L	S	1.4	% Wt				VISCOSITY					

Is the waste reactive with water? No with air? No

Is a representative sample provided? No

Give any other additional information on the hazards of the waste:

MCO 0616782

I hereby certify that the above information is complete and accurate.

Richard L. Koenig

Env. Prot. Tech.

3-3-87

Date

CUSTOMER INFORMATION:

Company Name Monsanto Co.RES Stream No. HO-1671Plant Address 1700 South Second St.Mailing Address SameState St. Louis, Mo. 63177

State _____ Zip _____

Company Contact, Technical Rich KoenigPhone 314-622-1469Company Contact, Business Max McCombsPhone 314-622-1467USEPA Generator I.D. No. MO0004954111State Generator I.D. No. Mo. 01002

GENERAL WASTE DESCRIPTION:

NC-220 Sump ResidueType of Process Generating Waste: Waste Phosphate Esters from Chemical Intermediate

Quantity Generated (per mo.)

125,000

Frequency (of removal)

Intermittent

TRANSPORTATION INFORMATION:

Hazardous Material: Poison B, N.O.S.

Hazardous Substances:

Concentration

Hazardous Substances

Concentration

Phenol50-80%Hazardous Characteristics: Poison BTransporter: RES (TX) IncPlacarding Poison

TRANSPORTATION EQUIPMENT:

MCO 0616783

Tank Truck ☒Vacuum Truck ☐Flatbed ☐Dump Truck ☐Bin ☐Barge ☐Tank Car ☐

Other _____

Method of Collection:

Fiberpaks ☐Drums ☐Tanks ☐Sumps ☐Other ☐

Other available transportation information:

Truck can be loaded from 8:00 AM - 2:00 PM. only

DETAILED WASTE DESCRIPTION AND REGULATORY COMPLIANCE:

000242

RCRA Characterization Codes

U 188

Reason for above characterization:

State Characterization Codes

Mo. Waste ID#24

OSHA: Contain listed compounds?

NO

EPA : PCB conc > 50 ppm?

NO

NRC: Radioactive?

NO

PHS: Infectious Wastes?

NO

FIFRA: Does this waste contain a pesticide for which the EPA has issued specific disposal requirements?

NO

CHEMICAL COMPOSITION:

Compound Name	Norm. Conc. Range % W	Chemical Formula
Partial Acids, Phosphate Esters, and	10-30%	
High Boilers		
Phenol	50-80%	C ₆ H ₅ OH
Nonyl Phenol	0-2%	C ₉ H ₁₉ OH
Cumyl Phenol	0-15%	C ₆ H ₅ (CH ₃) ₂ C ₆ H ₄ OH
Tributyl Acetate	0-5%	C ₁₂ H ₂₆ O ₂
Waste also contains varying amounts of water		

LABORATORY ANALYSIS

PHYSICAL PROPERTIES

Metals			CN		Mg/L		PHYSICAL STATE @ 25°C		BTU	
Pb	2.001	%	TOC		Mg/L		GAS	LIQUID	10,000-12,000	lb
Hg	2.001	%	COD		Mg/L		SOLID	SLUDGE	10	%
Cd		Mg/L	BOD		Mg/L		SLURRY	PASTE		
Bc		Mg/L	SS		Mg/L		GRANULAR	CRYSTAL		
As		Mg/L	TDS		Mg/L		POLYMERIC	AMORPHOUS		
Na/K		Mg/L	Br		% Wt		SINGLE PHASE			
Other		Mg/L	Cl		% Wt		MULTI PHASE			
		Mg/L	F		% Wt		OIL/WATER			
		Mg/L	I		% Wt		VISCOSITY	135 cps		
		Mg/L	S	201	% Wt					

Is the waste reactive with water?

NO

with air?

NO

Is a representative sample provided?

NO

Give any other additional information on the hazards of the waste:

MCO 0616784

I hereby certify that the above information is complete and accurate.

Richard L. Kenig

Customer Signature

Env. Prot. Tech

Title

6-19-81

Date



INDUSTRIAL TESTING LABORATORIES inc.

2350 Seventh Blvd.

• St. Louis, Missouri 63104

Chemists

000243

Engineers

Metallurgists

314/771-7111

Report No. 85-11-216

December 12, 1985

Examination of one (1) coal sample submitted marked, "#7, Boiler Ash".

Monsanto Company
Sauget, IL. 62201

Attn: Mr. Paul Hoemann

TEST REPORT

A. PROXIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
Moisture	0.50	----
Volatile Matter	3.85	3.86
Fixed Carbon	18.98	19.08
Ash	76.67	77.05
Sulfur	0.35	0.35
BTU/lb.	2,686	2,700

B. ULTIMATE ANALYSIS

Carbon	20.33	20.43
*Hydrogen	0.33	0.27
Nitrogen	0.12	0.12
Sulfur	0.35	0.35
Ash	76.67	77.05
*Oxygen	2.20	1.78

*Includes Moisture

MCO 0616784.01



INDUSTRIAL TESTING LABORATORIES inc.

2350 Seventh Blvd.

•

St. Louis, Missouri 63104

Chemists

Engineers

Metallurgists

000244

314/771-7111

Report No. 85-11-216 (a)

December 12, 1985

Examination of one (1) coal sample submitted marked, "#8, Boiler Ash".

Monsanto Company
Sauget, IL. 62201

Attn: Mr. Paul Hoemann

TEST REPORT

A. PROXIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
Moisture	1.41	—
Volatile Matter	13.51	13.70
Fixed Carbon	6.09	6.18
Ash	78.99	80.12
Sulfur	2.07	2.10
BTU/lb.	1,009	1,023

B. ULTIMATE ANALYSIS

Carbon	9.17	9.30
*Hydrogen	0.56	0.41
Nitrogen	0.07	0.07
Sulfur	2.07	2.10
Ash	78.99	80.12
*Oxygen	9.14	8.00

*Includes Moisture

MCO 0616786



000245

Report No. 85-11-216

Page 2.

C. Loss on Ignition

21.01%

Respectfully submitted,
INDUSTRIAL TESTING LABORATORIES, INC.

Allan M. Siegel
Allan M. Siegel, P.E.
Director

KL:ck
LN 63901-03

MCO 0616787



INDUSTRIAL TESTING LABORATORIES inc.

2350 Seventh Blvd.

•

St. Louis, Missouri 63104

Chemists

Engineers

Metallurgists

000246

314/771-7111

Report No. 85-11-216 (b)

December 12, 1985

Examination of one (1) coal sample submitted marked, "#9 Boiler Ash".

Monsanto Company
Sauget, IL. 62201

Attn: Mr. Paul Hoemann

TEST REPORT

A. PROXIMATE ANALYSIS

	<u>As Received</u>	<u>Dry Basis</u>
Moisture	0.10	—
Volatile Matter	9.56	9.57
Fixed Carbon	7.41	7.42
Ash	82.93	83.01
Sulfur	0.58	0.58
BTU/lb.	1,140	1,141

B. ULTIMATE ANALYSIS

Carbon	9.84	9.85
*Hydrogen	0.39	0.38
Nitrogen	0.06	0.06
Sulfur	0.58	0.58
Ash	82.93	83.01
*Oxygen	6.20	6.12

*Includes Moisture

MCO 0616788



000247

Report No. 85-11-216

Page 2.

C. Loss on Ignition

17.07%

Respectfully submitted,
INDUSTRIAL TESTING LABORATORIES, INC.

Allan M. Siegel

Allan M. Siegel, P.E.
Director

KL:ck
LN 63901-03

MCO 0616789



■H98496■

H 98496

Waste Profile Sheet Code

WMI Location of Original: _____

(SHADED AREAS FOR WMI USE ONLY)

WMI Sales Rep. #:

A. GENERAL INFORMATION

1. Generator Name: Monsanto Co 2. Generator USEPA ID: ILD000802702
3. Facility Address: W.G. Krummrich Plant 4. Generator State ID: 1631210006
500 Monsanto Ave
Savage, IL 62201 5. Zip Code: _____
6. Technical Contact: Rick Hampel 7. Title: Envir. Specialist 8. Phone: (618) 271-5835

B. MAIL WASTE MANAGEMENT, INC. INVOICES TO

B. MAIL WASTE MANAGEMENT, INC. INVOICES TO 1. ☒ Generating Facility (A, above), or
2. Company Name: _____ 3. Phone: () _____ - _____
4. Address: _____

_____ 5. Zip Code: _____

C. 1. NAME OF WASTE

2. **PROCESS GENERATING WASTE** Combustion of Coal in Powerhouse

3. Is this waste a Dioxin listed waste as defined in 40 CFR 261.31 (e.g., F020, F021, F022, F023, F026, F027, or F028)?
☐ Yes ☒ No If yes, **DO NOT COMPLETE** this form. Contact your Waste Management, Inc. sales representative for assistance.

D. PHYSICAL CHARACTERISTICS OF WASTE

1. Color: <u>Black</u>	2. Does the waste have a strong incidental odor? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If known, describe: _____	3. Physical State @ 70°F: <input type="checkbox"/> Solid <input type="checkbox"/> Semi-Solid <input type="checkbox"/> Liquid <input checked="" type="checkbox"/> Powder Other: _____	4. Layers: <input type="checkbox"/> Multilayered <input type="checkbox"/> Bi-layered <input checked="" type="checkbox"/> Single Phased	5. Specific Gravity: Range: <u>> 1</u>	6. Free Liquids: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Volume: _____ %
---------------------------	---	---	---	--	--

7. pH: ☐ ≤ 2 ☐ $> 2-4$ ☐ 4-7 ☐ 7 ☐ 7-10 ☐ 10- < 12.5 ☐ ≥ 12.5 ☐ Range _____ ☒ NA

8. Liquid Flash Point: ☐ <73°F ☐ 73-99°F ☐ 100-139°F ☐ 140-199°F ☒ ≥ 200°F ☐ None ☐ Closed Cup ☐ Open Cup

E. CHEMICAL COMPOSITION

[illegible]

Please note: The chemical composition total in the maximum column must be greater than or equal to 100%. T

2. Indicate if this waste contains any of the following:

	NONE	or	LESS THAN	or	ACTUAL
PCB's	<input type="checkbox"/>		<input checked="" type="checkbox"/> <	50 ppm	_____ ppm
Cyanides	<input type="checkbox"/>		<input checked="" type="checkbox"/> <	50 ppm	_____ ppm
Phenolics	<input type="checkbox"/>		<input checked="" type="checkbox"/> <	50 ppm	_____ ppm
Sulfides	<input type="checkbox"/>		<input checked="" type="checkbox"/> <	50 ppm	_____ ppm

F. METALS Indicate if this waste contains any of the following:

1. <input checked="" type="checkbox"/> KEP TOX/TCLP		or	2. <input type="checkbox"/> Total	
METAL	LESS THAN	or	ACTUAL	
(Parts Per Million)				
Arsenic	<input type="checkbox"/> < 5	<input type="checkbox"/> < 500	-	
Barium	<input type="checkbox"/> < 100		.24	
Cadmium	<input type="checkbox"/> < 1	<input type="checkbox"/> < 100	.02	
Chromium	<input type="checkbox"/> < 5		.01	
Lead	<input type="checkbox"/> < 5	<input type="checkbox"/> < 500	.02	
Mercury	<input type="checkbox"/> < 0.2	<input type="checkbox"/> < 20	.001	
Selenium	<input type="checkbox"/> < 1	<input type="checkbox"/> < 100	.01	
Silver	<input type="checkbox"/> < 5		.01	
Chromium-Hex	<input type="checkbox"/> < 5	<input type="checkbox"/> < 500		
Copper	<input type="checkbox"/> < 5			
Nickel	<input type="checkbox"/> < 5	<input type="checkbox"/> < 134		
Thallium	<input type="checkbox"/> < 5	<input type="checkbox"/> < 130		
Zinc	<input type="checkbox"/> < 5			

MCO 0616790

GENERATOR'S WASTE MATERIAL PROFILE SHEET (Continued) 000249

 H 98496

Waste Profile Sheet Code

G. OTHER HAZARDOUS CHARACTERISTICS

- Is this waste a listed solvent waste as defined by 40 CFR 261.31 (F001, F002, F003, F004, or F005)? ☐ Yes ☒ No
- Does this waste contain greater than 1000 ppm total halogenated organic compounds? ☐ Yes ☒ No
- Indicate if this waste is any of the following:

<input type="checkbox"/> RCRA Reactive	<input type="checkbox"/> Radioactive
<input type="checkbox"/> Water Reactive	<input type="checkbox"/> Etiological
<input type="checkbox"/> Explosive	<input type="checkbox"/> Pesticide Manufacturing Waste
<input type="checkbox"/> Shock Sensitive	<input type="checkbox"/> Other <u> </u>
<input type="checkbox"/> Pyrophoric	<input checked="" type="checkbox"/> None of the above

H. COMPLETE ONLY FOR WASTES INTENDED FOR FUELS or INCINERATION

	LESS THAN	or	ACTUAL
Beryllium	<input type="checkbox"/> < 5000 ppm		<u> </u> ppm
Potassium	<input type="checkbox"/> < 5000 ppm		<u> </u> ppm
Sodium	<input type="checkbox"/> < 5000 ppm		<u> </u> ppm
Total Bromine	<input type="checkbox"/> < 2 %		<u> </u> %
Total Chlorine	<input type="checkbox"/> < 35 %		<u> </u> %
Total Fluorine	<input type="checkbox"/> < 1 %		<u> </u> %
Total Sulfur			<u> </u> %

I. OPTIONAL — RECLAMATION, FUELS, OR INCINERATION PARAMETERS Provide if information is available.

- Range
- Heat Value (BTU/lb):
 - Water: %
 - Viscosity (cps): @ ☐ °F ☐ 100° F ☐ 150° F
 - Ash: %
 - Settleable solids: %
 - Vapor Pressure @ STP (mm/Hg):
 - Is this waste a pumpable liquid? ☐ Yes ☐ No
Type of pump?
 - Can this waste be heated to improve flow? ☐ Yes ☐ No
 - Is this waste soluble in water? ☐ Yes ☐ No
 - Particle size: Will the solid portion of this waste pass through a 1/8 inch screen? ☐ Yes ☐ No

J. TRANSPORTATION INFORMATION

- Is this a DOT Hazardous Material? ☐ Yes ☒ No
- Anticipated Annual Volume/Units: 16,500 Tons / yr
- Proper Shipping Name: Chemical Plant Waste - N.D.S. - (Non Hazardous)
- Hazard Class: None
- I.D. #: None
- Additional Description: (Boiler ash & Fly ash)
- Method of Shipment: ☐ Bulk Liquid ☒ Bulk Solid ☐ Drum (Type/Size): Other:
- CERCLA Reportable Quantity (RQ): N/A
- RQ Units (lb/kg): N/A
- USEPA Hazardous Waste? ☐ Yes ☒ No
- USEPA Hazardous Waste Number(s):
- State Hazardous Waste? ☐ Yes ☒ No
- State Hazardous Waste Number(s):

K. SPECIAL HANDLING INFORMATION None

☐ Additional Page(s) Attached

L. GENERATOR CERTIFICATION I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste material, and all relevant information regarding known or suspected hazards in the possession of the generator has been disclosed.

1. <u>Steven D. Smith</u> Signature	2. <u>Enrico Supt</u> Title
3. <u>Steven D. Smith</u> Name (Type or Print)	4. <u>10/3/89</u> Date

Monsanto

000250



FROM
NAME-LOCATION-PHONE

MAX W. MCCOMBS

W. G. KRUMMRICH PLANT

EXT 2322

DATE

July 13, 1989

Steve Smith

Harold Baker

Mike Foresman

SUBJECT

Boiler Ash EP Tox Results

REFERENCE

TO

Russ Sackett

Dave Richardson

Attached are the results of the boiler ash EP toxicity test and the regulatory limits. As you can see, metals are well within the acceptable ranges and the ash would not be considered a hazardous waste.

Max

Max W. McCombs

/sdg

Attachment

K

II

Site Q

6

EP Boiler
Toxicity of Ash

MCO 0616792

000251

Environmental Analysis, Inc.

3278 N. Lindbergh Blvd. • Florissant, MO 63033 • 314-921-4488



MONSANTO COMPANY

 PAGE NO : 2
 REPORT NO : 34830
 DATE : 06/26/89

RESULTS OF ANALYSIS

LOG NUMBER	SAMPLE DESCRIPTION	TEST NAME	RESULTS OF ANALYSIS	UNITS OF EXPRESSION
1016814	8915 BOIL. ASH 5/18c	EP Toxicity	261.24	Meth.
		EP Silver	<0.005	mg Ag
		EP Arsenic	<0.006	mg As
		EP Barium	0.244	mg Ba
		EP Cadmium	0.014	mg Cd
		EP Chromium	0.008	mg Cr
		EP Mercury	<0.0005	mg Hg
		EP Lead	0.016	mg Pb
		EP Selenium	<0.005	mg Se

MCO 0616793



§ 261.24

ate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(b) A solid waste that exhibits the characteristic of reactivity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number of D003.

§ 261.24 Characteristic of EP toxicity.

(a) A solid waste exhibits the characteristic of EP toxicity if, using the test methods described in Appendix II or equivalent methods approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21, the extract from a representative sample of the waste contains any of the contaminants listed in Table I at a concentration equal to or greater than the respective value given in that Table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering, is considered to be the extract for the purposes of this section.

(b) A solid waste that exhibits the characteristic of EP toxicity, but is not listed as a hazardous waste in Subpart D, has the EPA Hazardous Waste Number specified in Table I which corresponds to the toxic contaminant causing it to be hazardous.

TABLE I—MAXIMUM CONCENTRATION OF CONTAMINANTS FOR CHARACTERISTIC OF EP TOXICITY

EPA hazardous waste number	Contaminant	Maximum concentration (milligrams per liter)
D004	Arsenic	5.0
D005	Berium	100.0
D006	Cadmium	1.0
D007	Chromium	5.0

40 CFR Ch. I (7-1-88 Edition)

TABLE I—MAXIMUM CONCENTRATION OF CONTAMINANTS FOR CHARACTERISTIC OF EP TOXICITY—Continued

EPA hazardous waste number	Contaminant	Maximum concentration (milligrams per liter)
D008	Lead	5.0
D009	Mercury	0.2
D010	Selenium	1.0
D011	Silver	5.0
D012	Endrin (1,2,3,4,10,10-hexamethyl-1,7-epoxy-1,4,4a,5,5,6,7,8,8a-octahydro-1,4-endo, endo-6,8-dimethylo-naphthalene)	0.02
D013	Lindane (1,2,3,4,5,6-hexachlorocyclohexane, gamma isomer)	0.4
D014	Methoxychlor (1,1,1-Trichloro-2,2-bis (p-methoxyphenyl)ethanol)	10.0
D015	Toxaphene (C ₁₂ H ₈ Cl ₆ , Technical chlorinated camphene, 67-69 percent chlorine)	0.5
D016	2,4-D, (2,4-Dichlorophenoxyacetic acid)	10.0
D017	2,4,5-TP Silver (2,4,5-Trichlorophenoxypropionic acid)	1.0

Subpart D—Lists of Hazardous Wastes

§ 261.30 General.

(a) A solid waste is a hazardous waste if it is listed in this subpart, unless it has been excluded from this list under §§ 260.20 and 260.22.

(b) The Administrator will indicate his basis for listing the classes or types of wastes listed in this Subpart by employing one or more of the following Hazard Codes:

Ignitable Waste
Corrosive Waste
Reactive Waste
EP Toxic Waste
Acute Hazardous Waste
Toxic Waste

SEE C

Appendix VII identifies the constituent which caused the Administrator to list the waste as an EP Toxic Waste (E) or Toxic Waste (T) in §§ 261.31 and 261.32.

(c) Each hazardous waste listed in this subpart is assigned an EPA Hazardous Waste Number which precedes the name of the waste. This number must be used in complying with the

G

]

MCO 0616795

APPENDIX G

Index of Documents

Area I Unknown Site

Letters dated 2/7/84, 2/8/84, 3/2/84, 2/2/84, 12/13/83 to or from Paul Sauget (000253 to 000259)

Memo dated 1/19/82 re Paul Sauget (000260)

Letter dated 9/29/82 from Paul Sauget (000261)

Memo dated 12/28/79 re Paul Sauget (000262)

Letter dated 11/22/78 from Paul Sauget (000263)

Agreement dated 1/1/79 re landfill signed by Paul Sauget (000264 to 000269)

Service Agreement dated 3/1/86 with MTS, Inc. signed by Paul Sauget (000270 to 000272)

Letter dated 3/18/86 to Paul Sauget (000273 to 000276)

Service Agreement dated 8/1/84 MTS, Inc. signed by Paul Sauget (000277 to 000279)

Agreement dated 12/11/57 re dumping privileges with Leo Sauget (000280 to 000281)

MTS Trucking invoices 1982 through 1989 (000282 to 000516)

Area II Unknown Site

Memo dated 1/29/85 re pump test right of way with Illinois Central Gulf Railroad property (000517 to 000520)

MCO 0616796

Paul Sauget

2700 Falling Springs Road
Sauget, Illinois 62201

February 7, 1984

Mr. Warren L. Smull
General Superintendent
Environmental Affairs
Monsanto Industrial Chemicals Co.
Sauget, Illinois 62201

Dear Warren:

We propose to haul ash from the Monsanto Krummrich and Monsanto Queeny plants for the sum of \$7500.00 per month commencing in mid-April, 1984, with a two (2) year contract with option to negotiate after that time.

Sincerely,


PAUL SAUGET

PS/blw

MCO 0616797

Paul Sauget

2700 Talling Springs Road
Sauget, Illinois 62201

February 8, 1984

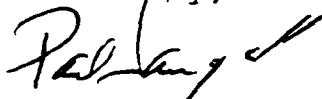
Mr. Warren Smull
General Superintendent
Environmental Affairs
Monsanto Industrial Chemicals Co.
Sauget, Illinois 62201

Dear Warren:

As per my letter to you and our conversation on February 7, 1984, I want to change the date of the ash hauling contract to become effective on May 1, 1984.

Also, I would like to know definitely about the landfill contract so that I can notify Edwin Cooper on the status thereof.

Sincerely,



PAUL SAUGET

PS/blw

MCO 0616799

Paul Sauget

2700 Falling Springs Road
Sauget, Illinois 62201

March 2, 1984

Mr. Warren L. Smull
General Superintendent
Environmental Affairs
Monsanto Industrial Chemicals Co.
Sauget, Illinois 62201

1200 to VFR
5300 to WGR
6500

Dear Warren:

We propose to haul ash from the Monsanto Krummrich and Monsanto Queeny plants for the sum of \$6500.00 per month commencing May 1, 1984, with a two year contract with option to negotiate after that time. The contract will be with M.T.S., Inc.

Sincerely,

Paul Sauget
PAUL SAUGET *blw*

PS/blw

Bruce Williams x1541 VFR

MCO 0616800

PAUL SAUGET
2700 Falling Springs Road
Sauget, IL 62201

February 2, 1984

Mr. Warren L. Smull
General Superintendent
Environmental Affairs
Monsanto Industrial Chemicals Co.
Sauget, IL 62201

Dear Warren:

In reference to your letter of December 13, 1983, I anticipate having adequate landfill capacity until mid-October, 1984.

Sincerely,



PAUL SAUGET

PS/blw

MCO 0616801

Monsanto

000257

MONSANTO INDUSTRIAL CHEMICALS CO.
Sauget, Illinois 62201
Phone: (618) 271-5835

December 13, 1983

Honorable Paul Sauget
Mayor, Village of Sauget
2897 Monsanto Avenue
Sauget, Illinois 62206

Dear Paul:

Confirming our discussion, we anticipate utilizing your landfill per our current agreement until approximately mid-April 1984. You indicated that capacity on the site would be adequate for our needs until at least then, and likely into the third quarter of 1984.

Sincerely,



Warren L. Smull
General Superintendent
Environmental Affairs

dah

bcc: J. W. Molloy
B. R. Williams
R. C. Shaneberger
J. Christian

MCO 0616802

Estimated 1034
 Ash Machine Costs

Cost Estimate
 \$ 65 / load (10 miles)
 \$ 75 / load (20 miles)

Volume = 1200 per year = 44 m lbs Hoag
 (1 load) 2 BA 270 = 10 m lbs

3541 (overhead)

Total Estimate Cost:

$65 \times 1470 = 96,650$

or

$75 \times 1470 = 110,250$

MCO 0616803

Value of 1470 (miles) $\frac{1}{4} \sqrt[4]{1470 \times 25 \times 1} = 50 \text{ k/hr}$

175

∴ Total Cost and ... low as 110 - 50 = 60 k/hr
 or if truck was longer 110 (25) = 73 k 73 - 50 = 23 k/hr

Value of estimate ... $(1. \times 110,250) = 52 \text{ k}$

000258
 1034
 1034
 1034

TRUCK = 35 yd

35 yd = (overhead)

Average Machine
 Summer 3/4
 Winter 6
 Overall 5

TRUCK 80,000

5-yr 16,000

20% M 16,000
+ 32,000

Labor 20,000

Fuel Lim 5,000

\$ 57,000

Profit 20%⁺ 13,000

\$ 70,000

MCO 0616804

L F Truck + Profit 45,000

115,000

FROM
NAME, ADDRESS, CITY, STATE, ZIP

DATE January 19, 1982

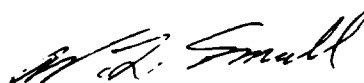
J. W. Molloy
Mayor Paul Sauget

SUBJECT

REFERENCE

TO John Christian

We have reached agreement with Paul Sauget on a price increase for landfilling and ash hauling services, per Contract No. 02-03-0563, dated 1/1/79. The price will increase from \$8,010 to \$9,600 per month, retroactive to 1/1/82. This does not include the special landfill charge of \$986.03 per month, which will continue through calendar 1982, per our letter agreement of 12/28/79, but does include consideration for ash disposal from the Queeny and Krummrich Plants. This represents a 19.85% increase, or approximately 10% per year, since our last increase in 1/80.



W. L. Smull

emz

K

#6

G

I~~Specific~~ Nonspecific

8

MCO 0616805

000261

PAUL SAUGET
2700 Falling Springs Road
Sauget, IL 62201

September 29, 1982

Mr. Warren Smull
Monsanto Company
Sauget, IL 62201

Dear Warren:

Effective January 1, 1983 the landfill contract will be on a monthly basis only, as the area for which I have a permit is nearly full.

The monthly charge will remain the same.

As of October 1, 1982 Sauget & Co. will be dissolved and will operate under the name of Paul Sauget.

Yours truly,



PAUL SAUGET

PS/blw

k
I

#7
67

~~Non~~ Non-specific

#8

MCO 0616806

Monsanto

000262

TO: LOCATION: FROM: W. L. Smull / W. G. Krummrich

December 28, 1979

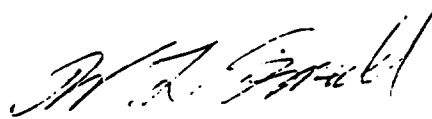
Sanitary Landfill

B. R. Williams
J. W. Molloy
L. L. Dearing
E. R. Billen

REFERENCE

TO : John Christian

At the request of Monsanto and Edwin Cooper, Paul Sauget has purchased additional land adjacent to his landfill to extend the life of the facility. This protects our interest by providing us with a longer term landfill site that is a short haul from the plant and minimum cost. To compensate Sauget for this added investment, Jack Molloy has agreed to a special landfill charge of \$986.03 per month for a period of 36 months commencing in January 1980. Please issue a purchase order to Sauget covering this special landfill charge. Sauget will include this as a line item on his normal monthly landfill billing.


W. L. Smull

/gh

WLS:

Purchase price from IC was \$57,000. Monthly payments are \$1,972.05/Mo. for 36 mos.
Closing on purchase was 12/21/79

MCO 0616807

000263

SAUGET & CO.
2700 Monsanto Avenue
Sauget, Illinois 62206

November 22, 1978

Mr. D. M. Francisco
Purchasing Supervisor
Monsanto Chemical Intermediates Co.
Sauget, Illinois 62201

Dear Mr. Francisco:

I am returning herewith the purchase order for the solid waste facilities in Sauget. Due to increased costs in wages, insurance, etc. I am requesting the contract fee be increased to \$7,282.00 per month for the year 1979.

Please feel free to call me if you have any question about this.

Yours truly,

Paul Sauget

PAUL SAUGET

PS/bjl

K
I
~~Don~~ Don
~~specific~~ specific
8

11

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MCO 0616809

CONTRACT NO. 02-03-0563

RENEWED 1/1/79AGREEMENT FOR SANITARY LANDFILL PRIVILEGES

This Agreement made and entered into as of January 1, 1979, by and between SAUGET AND COMPANY, a Delaware Corporation located in Sauget Village, St. Clair County, State of Illinois, hereinafter called "Sauget" and MONSANTO COMPANY, a Delaware Corporation with General Offices at St. Louis, Missouri, hereinafter called "Monsanto."

WITNESSETH THAT:

WHEREAS, Monsanto operates chemical industries situated in Sauget Village, Centerville Township, St. Clair County, Illinois, and at 1700 South Second Street, St. Louis, Missouri, and desires to dispose of refuse materials from said industries, and

WHEREAS, Sauget is willing to permit the disposal of such refuse by Monsanto on Sauget's Sanitary Landfill upon the terms and conditions hereinafter set out,

NOW, THEREFORE, it is hereby agreed by and between the parties hereto as follows:

1. Sauget agrees as follows:

- a) To operate for Monsanto's exclusive use said Sanitary Landfill, located on property leased from Union Electric Company north of Monsanto Avenue and east of the Corps of Engineers Levee between the Illinois Central-Gulf Railroad Track.

MCO 0616810

-2-

- b) To permit Monsanto to haul to said Sanitary Landfill any or all refuse resulting from the normal operations at Monsanto's Chemical Plants.
- c) To operate said Sanitary Landfill in accordance with the Illinois EPA Rules and Regulations and the operating permit issued to Sauget and Company (#1973-2) on January 11, 1973, by the Illinois EPA.
- d) To allow contractors performing work for Monsanto at its W. G. Krummrich Plant and its J. F. Queeny Plant to haul and dump refuse resulting from such work upon presentation of a permit issued by Monsanto identifying the contractor, the project involved and the term of such project. One permit shall be sufficient for each contractor for each project for the term of such project. Such contractor shall comply with all rules and regulations applicable to said dump, whether promulgated by Sauget or by the Illinois Environmental Protection Agency or otherwise and, in the event that such contractor violates any of said rules and regulations, Sauget may cancel such permit and, if it does so, shall notify Monsanto in writing of such cancellation.
- e) To furnish the services of a dump truck and driver on a not less than forty (40) hour per week basis for the purpose of (1) hauling cover material for the Sanitary Landfill and (2) hauling cinders from the Monsanto Plants for use as cover material and (3)

MCO 0616812

- 3 -

providing other services as necessary for the proper operation of the Sanitary Landfill.

f) To furnish the services of a bulldozer and bulldozer operator on a not less than forty (40) hour per week basis for the purpose of compaction and covering of refuse deposited on the Sanitary Landfill site.

g) To permit the unloading of the refuse which Monsanto or its contractors hauls to the Sanitary Landfill on a six day per week basis (Monday through Saturday) including Holidays only between the hours of 8:00 a.m. and 4:30 p.m. At all other times the Sanitary Landfill will be closed and padlocked.

h) To maintain the Sanitary Landfill at all times in such condition as to allow the refuse to be freely unloaded without delay.

i) To maintain at all times access for trucks to dump from the nearest improved road.

j) To wash refuse container boxes at the Sanitary Landfill when requested by Monsanto so long as water is available without cost, for use by Sauget.

k) To hold Monsanto harmless from and indemnify Monsanto against any and all liability, loss or expense that might arise by reason of damage to property or crops or injury to person or persons resulting directly or indirectly from the operation

MCO 0616813

- 4 -

of said Sanitary Landfill from materials deposited therein or from Monsanto's use thereof.

1) To treat as Monsanto's confidential property and not use or disclose to others during or subsequent to the term of this Agreement, except as is necessary to perform the work hereunder, any information (including any technical information, experience or data) regarding Monsanto's plans, programs, plant processes, products, costs, equipment, operations or customers which may come within the knowledge of Sauget or his employees in the performance of the work or which may developed by Sauget in the course of Sauget's performance of the work without in each instance securing the prior written consent of Monsanto. Nothing herein, however, shall prevent Sauget from disclosing to others or using in any manner information which Sauget can show:

- 1) has been published and has become part of the public domain other than by acts of omissions of Sauget or his employees;
- 2) has been furnished or made known to Sauget by third parties as a matter of right and without restriction on disclosure; or
- 3) was in his possession at the time he entered into this Agreement and which was not acquired by Sauget directly or indirectly from Monsanto, its employees or its agents.

MCO 0616814

-5-

Sauget shall restrict the knowledge of all information regarding the work to as few as possible of his employees (and only to those directly connected with the performing of the work) and shall also, upon request by Monsanto, cause such persons involved in the work on Sauget's behalf as Monsanto designates to sign individual secrecy agreements in a form satisfactory to Monsanto.

m) Scavenging Forbidden. Under no circumstances shall any materials or containers which have been delivered to the Landfill by Monsanto for disposal be scavenged or retrieved for reuse or resale. Sauget covenants that it will use its best efforts to assure that this prohibition is reasonably implemented.

2. Monsanto agrees as follows:

- a) To pay to Sauget at the end of each month during the year 1979 the sum of Seven Thousand Two Hundred Eighty Two Dollars (\$7,282.00). Sauget to invoice for this amount monthly.
- b) To furnish cinders as they are available from the W. G. Krummrich Plant and the J. F. Queeny Plant. Such cinders are to be used as Monsanto deems necessary in the maintenance of the Sanitary Landfill.
- c) All dumping at said Sanitary Landfill by Monsanto and by its contractors shall be in conformity with any and all rules and regulations applicable to said

MCO 0616815

-6-

Sanitary Landfill whether promulgated by Sauget or by the Illinois Environmental Protection Agency or otherwise.

3. This Agreement shall commence with the date set forth at its beginning and shall continue for a period of twelve (12) months unless sooner terminated by either party giving to the other party at least ninety days' written notice of the party's intention to cancel same. This notice period is in the event the Illinois Environmental Protection Agency shall prevent either party from continued performance hereunder.
4. Should this Agreement be terminated prior to December 31, 1979, then payment shall be prorated on the basis of Seven Thousand Two Hundred Eighty Two Dollars (\$7,282.00) per month for the year 1979.

IN WITNESS WHEREOF, this Agreement has been executed on behalf of each party as of the day and year set forth at its beginning.

MONSANTO COMPANY

By

Title

Witness

SAUGET AND COMPANY

By

Title

Witness

MCO 0616816

MASTER SERVICE AGREEMENT**000270**

1. This Agreement is made as of March 1, 1986, by and between Monsanto Company, 800 North Lindbergh Boulevard, St. Louis, Missouri 63166 ("Monsanto"), and M.T.S., Inc.,
2700 Falling Springs Road, Sauget, Illinois 62206

("Contractor").

2. The term "Services" shall mean furnishing all operations, labor, equipment, materials and supplies and doing all things necessary to properly perform at Monsanto's W. G. Krummrich Plant, Sauget, Illinois ("jobsite") the category of services set forth in Exhibit "A" as Monsanto may specify by written Work Order issued on or before March 1, 1988.

3. The term "Work Order" shall mean the written order issued by Monsanto to Contractor designating the Services to be performed at the jobsite under the terms and conditions of this Agreement. Each Work Order shall contain a statement substantially as follows: "THE SERVICES AUTHORIZED BY THIS WORK ORDER SHALL BE PERFORMED IN ACCORDANCE WITH AND SHALL BE GOVERNED BY THE PROVISIONS OF MASTER SERVICE AGREEMENT NO. _____ DATED March 1, 1986."
If a Monsanto purchase order form is used for the issuance of a Work Order, all terms and conditions on the reverse side of such form shall be null and void.

4. The Services shall be commenced and completed as soon as practicable under a schedule approved by Monsanto.

5. For proper performance of the Services, Monsanto shall pay Contractor in accordance with the terms of the Work Order. Contractor shall pay all applicable taxes.

6. Contractor agrees to comply with all applicable laws, codes, rules and regulations pertaining to the Services, including Monsanto's Site Conditions and Regulations.

7. Contractor warrants that the Services will be of high quality with workmanship and materials proper and sufficient for the purpose contemplated.

8. If the Services are required by law or public authority to be inspected, Contractor shall (1) give Monsanto timely notice of the date fixed for such inspection, and (2) secure all required certificates of inspection.

9. Contractor shall not assign, subcontract or delegate this Agreement, in whole or in part, without the prior written consent of Monsanto. Contractor shall not be relieved of any of his obligations under this Agreement notwithstanding any such written consent by Monsanto.

10. Monsanto may at any time by written order issue additional instructions or provide for additions to or reductions from the Services ("changes") and Contractor agrees to promptly comply. All such changes shall be subject to the provisions of this Agreement to the same extent and with the same effect as if originally set forth herein. If appropriate, an equitable adjustment will be made to the price and/or schedule.

11. Except as hereinafter set forth, Contractor agrees to (1) indemnify and save Monsanto and its employees harmless against any and all demands, claims, suits, losses, damages, costs and expenses which they may hereafter suffer or incur (arising out of or in connection with the Services) as a result of bodily injury to any person or damage to any property occurring to, or caused in whole or in part by, Contractor (or his employees) or any person, firm or corporation directly or indirectly employed or engaged by Contractor, and (2) upon Monsanto's request promptly defend the same at his expense. Monsanto agrees that Contractor will not be liable for (1) loss of use resulting from damage to Monsanto's property under Contractor's care, custody or control, or (2) demands, claims, suits, losses, damages, costs and expenses arising out of bodily injury to any person or damage to any property caused by or resulting from the sole negligence of Monsanto.

MCO 0616817

12. Contractor agrees to maintain at his expense at least the following insurance: Workmen's Compensation (Statutory); Employer's Liability (\$300,000 each occurrence); Public Liability-Bodily Injury (\$200,000 each person, \$500,000 each occurrence); Public Liability-Property Damage (\$100,000 each occurrence); Automobile Liability-Bodily Injury (\$200,000 each person, \$500,000 each occurrence) and Automobile Liability-Property Damage (\$50,000 each occurrence). The public liability insurance shall also include coverage for all of Contractor's contractual liability under paragraph 11 hereof with limits not less than those set forth above. Contractor shall not undertake any Services on Monsanto's premises unless and until he has obtained the insurance set forth above and certificates of insurance confirming such coverages have been approved by Monsanto.

13. Monsanto may at any time by written notice terminate this Agreement (or any Work Orders issued pursuant thereto) or suspend, delay or interrupt all or any part of the Services thereunder. If Monsanto terminates for any reason other than breach by Contractor, Monsanto will pay Contractor for all costs previously incurred by Contractor in good faith in connection with the Services, plus a reasonable allowance for overhead and profit, but not to exceed the prices set forth in this Agreement or Work Orders issued pursuant thereto. If the Services are suspended, delayed or interrupted by Monsanto for a period of ninety days (unless otherwise agreed), upon giving Monsanto sixty days prior written notice Contractor may elect to treat such action as if Monsanto had terminated pursuant to the provisions of this paragraph. If Contractor is authorized to resume the Services, an equitable adjustment will be made to the price and/or schedule, as appropriate.

14. Contractor agrees to indemnify and save Monsanto harmless against any and all liens and encumbrances (arising out of or in connection with performance of the Services) and to keep Monsanto's premises free from all such liens and encumbrances.

15. Contractor is and shall remain an independent contractor in his performance of the Services and neither Contractor nor anyone directly or indirectly employed or engaged by Contractor shall make any representations to the contrary.

16. Contractor agrees that payment, termination, suspensions, delays, interruptions or acceptance of completed Services shall not terminate his obligations under paragraphs 7, 8, 9, 11, 14 or 16 hereof.

17. This Agreement (including attached Exhibit(s) "A" thru _____) is the final, complete and exclusive statement of the agreement between Monsanto and Contractor. No terms, conditions, understandings, usage of the trade, courses of dealing or agreements purporting to modify, vary, explain or supplement this Agreement shall be binding unless hereafter made in writing and signed by Monsanto and Contractor. The validity, interpretation and performance of this Agreement shall be governed by and construed in accordance with the laws of the jobsite location.

18. Special Provisions (if any):

MCO 0616819

IN WITNESS WHEREOF, Monsanto and Contractor have executed this Agreement effective as of the date set forth at the beginning.

MONSANTO COMPANY

By

Title

Witness

John A. Christie
Purchasing Supervisor
Jelly Bell

By

Title

Witness

M.T.S., Inc.
Paul Lang
Pm
Gronne Lang

EXHIBIT "A"
MASTER SERVICE AGREEMENT NO. STLK-1006

1.0 Category of Services - General Description

Hauling Coal from Pillsbury	\$ 1.60 per ton March 1, 1986 - February 28, 1987
	\$ 1.75 per ton March 1, 1987 - February 28, 1988
Overtime, Sunday and Holiday premium	\$.20 per ton
Hauling Coal from E. G. Bussen	\$ 3.00 per ton
Overtime, Sunday and Holiday premium	.50 per ton
Hauling Coal from in-plant storage to Power House	
Truck and driver	\$30.00 per hour
Overtime, Sunday and Holiday premium	8.00 per hour
Load and operator for in-plant loading and stacking of coal	\$50.00 per hour
Overtime, Sunday and Holiday premium	8.00 per hour

Manpower and equipment will be available
on an around the clock basis.

MCO 0616820

Monsanto

Monsanto Chemical Company
500 Monsanto Ave.
Sauget, Illinois 62206-1196
Phone: (618) 271-5835

March 18, 1986

M.T.S., Inc.
2700 Falling Springs Road
Sauget, Illinois 62206

Attention: Mr. Paul Sauget

Dear Mr. Sauget:

Enclosed please find two (2) copies of our Master Service Agreement for your company.

Please sign both copies and return one to my attention at the above address.

Thanking you in advance, I remain,

Sincerely,

John J. Christian
John J. Christian
Purchasing Supervisor

/dev

Enclosure

12
I

~~3~~ ~~12~~ ~~12~~

#8

Continuation
of Master
Service

Agreement

NO. STLK - 100

#14
G

MCO 0616821

MASTER SERVICE AGREEMENT

1. This Agreement is made as of March 1, 1986, by and between Monsanto Company, 800 North Lindbergh Boulevard, St. Louis, Missouri 63166 ("Monsanto"), and M.T.S., Inc.,
2700 Falling Springs Road, Sauget, Illinois 62206

("Contractor").

2. The term "Services" shall mean furnishing all operations, labor, equipment, materials and supplies and doing all things necessary to properly perform at Monsanto's W. G. Krummrich Plant, Sauget, Illinois ("jobsite") the category of services set forth in Exhibit "A" as Monsanto may specify by written Work Order issued on or before March 1, 1988.

3. The term "Work Order" shall mean the written order issued by Monsanto to Contractor designating the Services to be performed at the jobsite under the terms and conditions of this Agreement. Each Work Order shall contain a statement substantially as follows: "THE SERVICES AUTHORIZED BY THIS WORK ORDER SHALL BE PERFORMED IN ACCORDANCE WITH AND SHALL BE GOVERNED BY THE PROVISIONS OF MASTER SERVICE AGREEMENT NO. _____ DATED March 1, 1986."

If a Monsanto purchase order form is used for the issuance of a Work Order, all terms and conditions on the reverse side of such form shall be null and void.

4. The Services shall be commenced and completed as soon as practicable under a schedule approved by Monsanto.

5. For proper performance of the Services, Monsanto shall pay Contractor in accordance with the terms of the Work Order. Contractor shall pay all applicable taxes.

6. Contractor agrees to comply with all applicable laws, codes, rules and regulations pertaining to the Services, including Monsanto's Site Conditions and Regulations.

7. Contractor warrants that the Services will be of high quality with workmanship and materials proper and sufficient for the purpose contemplated.

8. If the Services are required by law or public authority to be inspected, Contractor shall (1) give Monsanto timely notice of the date fixed for such inspection, and (2) secure all required certificates of inspection.

9. Contractor shall not assign, subcontract or delegate this Agreement, in whole or in part, without the prior written consent of Monsanto. Contractor shall not be relieved of any of his obligations under this Agreement notwithstanding any such written consent by Monsanto.

10. Monsanto may at any time by written order issue additional instructions or provide for additions to or reductions from the Services ("changes") and Contractor agrees to promptly comply. All such changes shall be subject to the provisions of this Agreement to the same extent and with the same effect as if originally set forth herein. If appropriate, an equitable adjustment will be made to the price and/or schedule.

11. Except as hereinafter set forth, Contractor agrees to (1) indemnify and save Monsanto and its employees harmless against any and all demands, claims, suits, losses, damages, costs and expenses which they may hereafter suffer or incur (arising out of or in connection with the Services) as a result of bodily injury to any person or damage to any property occurring to, or caused in whole or in part by, Contractor (or his employees) or any person, firm or corporation directly or indirectly employed or engaged by Contractor, and (2) upon Monsanto's request promptly defend the same at his expense. Monsanto agrees that Contractor will not be liable for (1) loss of use resulting from damage to Monsanto's property under Contractor's care, custody or control, or (2) demands, claims, suits, losses, damages, costs and expenses arising out of bodily injury to any person or damage to any property caused by or resulting from the sole negligence of Monsanto.

MCO 0616822

12. Contractor agrees to maintain at his expense at least the following insurance: Workmen's Compensation (Statutory); Employer's Liability (\$300,000 each occurrence); Public Liability-Bodily Injury (\$200,000 each person, \$500,000 each occurrence); Public Liability-Property Damage (\$100,000 each occurrence); Automobile Liability-Bodily Injury (\$200,000 each person, \$500,000 each occurrence) and Automobile Liability-Property Damage (\$50,000 each occurrence). The public liability insurance shall also include coverage for all of Contractor's contractual liability under paragraph 11 hereof with limits not less than those set forth above. Contractor shall not undertake any Services on Monsanto's premises unless and until he has obtained the insurance set forth above and certificates of insurance confirming such coverages have been approved by Monsanto.

13. Monsanto may at any time by written notice terminate this Agreement (or any Work Orders issued pursuant thereto) or suspend, delay or interrupt all or any part of the Services thereunder. If Monsanto terminates for any reason other than breach by Contractor, Monsanto will pay Contractor for all costs previously incurred by Contractor in good faith in connection with the Services, plus a reasonable allowance for overhead and profit, but not to exceed the prices set forth in this Agreement or Work Orders issued pursuant thereto. If the Services are suspended, delayed or interrupted by Monsanto for a period of ninety days (unless otherwise agreed), upon giving Monsanto sixty days prior written notice Contractor may elect to treat such action as if Monsanto had terminated pursuant to the provisions of this paragraph. If Contractor is authorized to resume the Services, an equitable adjustment will be made to the price and/or schedule, as appropriate.

14. Contractor agrees to indemnify and save Monsanto harmless against any and all liens and encumbrances (arising out of or in connection with performance of the Services) and to keep Monsanto's premises free from all such liens and encumbrances.

15. Contractor is and shall remain an independent contractor in his performance of the Services and neither Contractor nor anyone directly or indirectly employed or engaged by Contractor shall make any representations to the contrary.

16. Contractor agrees that payment, termination, suspensions, delays, interruptions or acceptance of completed Services shall not terminate his obligations under paragraphs 7, 8, 9, 11, 14 or 16 hereof.

17. This Agreement (including attached Exhibit(s) "A" thru _____) is the final, complete and exclusive statement of the agreement between Monsanto and Contractor. No terms, conditions, understandings, usage of the trade, courses of dealing or agreements purporting to modify, vary, explain or supplement this Agreement shall be binding unless hereafter made in writing and signed by Monsanto and Contractor. The validity, interpretation and performance of this Agreement shall be governed by and construed in accordance with the laws of the jobsite location.

18. Special Provisions (if any):

MCO 0616823

IN WITNESS WHEREOF, Monsanto and Contractor have executed this Agreement effective as of the date set forth at the beginning.

MONSANTO COMPANY

By

Title

Witness

John A. Christie
Purchasing Supervisor
John A. Christie

By

Title

Witness

EXHIBIT "A"
 MASTER SERVICE AGREEMENT NO. _____

1.0 Category of Services - General Description

Hauling Coal from Pillsbury	\$ 1.60 per ton March 1, 1986 - February 28, 1987
	\$ 1.75 per ton March 1, 1987 - February 28, 1988
Overtime, Sunday and Holiday premium	\$.20 per ton
Hauling Coal from E. G. Bussen	\$ 3.00 per ton
Overtime, Sunday and Holiday premium	.50 per ton
Hauling Coal from in-plant storage to Power House	
Truck and driver	\$30.00 per hour
Overtime, Sunday and Holiday premium	8.00 per hour
Load and operator for in-plant loading and stacking of coal	\$50.00 per hour
Overtime, Sunday and Holiday premium	8.00 per hour

Manpower and equipment will be available
 on an around the clock basis.

MCO 0616824

12. Contractor agrees to maintain at his expense at least the following: Workmen's Compensation (Statutory); Employer's Liability (\$500,00 each occurrence); Public Liability-Bodily Injury (\$1,000,000 each occurrence); Public Liability-Property Damage (\$500,000 each occurrence); Automobile Liability-Bodily Injury (\$200,000 each person, \$500,000 each occurrence) and Automobile Liability-Property Damage (\$100,000 each occurrence). The public liability insurance shall also include coverage for all of Contractor's contractual liability under paragraph 11 hereof with limits not less than those set forth above. Contractor shall not undertake any Services on Monsanto's premises unless and until he has obtained the insurance set forth above and certificates of insurance confirming such coverages have been approved by Monsanto.

13. Monsanto may at any time by written notice terminate this Agreement (or any Work Orders issued pursuant thereto) or suspend, delay or interrupt all or any part of the Services thereunder. If Monsanto terminates for any reason other than breach by Contractor, Monsanto will pay Contractor for all costs previously incurred by Contractor in good faith in connection with the Services, plus a reasonable allowance for overhead and profit, but not to exceed the prices set forth in this Agreement or Work Orders issued pursuant thereto. If the Services are suspended, delayed or interrupted by Monsanto for a period of ninety days (unless otherwise agreed), upon giving Monsanto sixty days prior written notice Contractor may elect to treat such action as if Monsanto had terminated pursuant to the provisions of this paragraph. If Contractor is authorized to resume the Services, an equitable adjustment will be made to the price and/or schedule, as appropriate.

14. Contractor agrees to indemnify and save Monsanto harmless against any and all liens and encumbrances (arising out of or in connection with performance of the Services) and to keep Monsanto's premises free from all such liens and encumbrances.

15. Contractor is and shall remain an independent contractor in his performance of the Services and neither Contractor nor anyone directly or indirectly employed or engaged by Contractor shall make any representations to the contrary.

16. Contractor agrees that payment, termination, suspensions, delays, interruptions or acceptance of completed Services shall not terminate his obligations under paragraphs 7,8,9,11,14 or 16 hereof.

17. This Agreement (including attached Exhibit "A" is the final, complete and exclusive statement of the agreement between Monsanto and Contractor. No terms, conditions, understandings, usage of the trade, courses of dealing or agreements purporting to modify, vary, explain or supplement this Agreement shall be binding unless hereafter made in writing and signed by Monsanto and Contractor. The validity, interpretation and performance of this Agreement shall be governed by and construed in accordance with the laws of the jobsite location

MCO 0616827

IN WITNESS WHEREOF, Monsanto and Contractor have executed this Agreement effective as of the date set forth at the beginning.

MONSANTO COMPANY

By

Title

Witness

M.T.S., INC.

By

Title

Witness

EXHIBIT "A"
MASTER SERVICE AGREEMENT NO. _____

1.0 Category of Services - General Description

Hauling coal from E. G. Bussen	\$ 2.60 per ton
Overtime, Sunday & Holiday premium	.50 per ton
Hauling coal from in plant storage to Power House	
Truck and driver	\$30.00 per hour
Overtime, Sunday & Holiday premium	8.00 per hour
Loader and operator for in plant loading	
and stacking of coal	\$50.00 per hour
Overtime, Sunday & Holiday premium	8.00 per hour

Manpower and equipment will be available on
an around the clock basis.

MCO 0616828

AGREEMENT FOR DUMPING PRIVILEGES

This Agreement made and entered into this 11th day of December, 1957, by and between LEO SAUGET, of Monsanto Village, St. Clair County, State of Illinois, hereinafter called "Sauget" and the MONSANTO CHEMICAL COMPANY, a Delaware Corporation with General Offices at St. Louis, Missouri, hereinafter called "Monsanto."

WITNESSETH THAT:

WHEREAS, Monsanto owns and operates a chemical industry situated in the Village of Monsanto, Centerville Township, St. Clair County, Illinois, and desires to dispose of refuse materials from said industry, and

WHEREAS, Sauget owns certain property in Monsanto Village, Centerville Township, St. Clair County, Illinois, which is operated by Sauget as a private dump, and

WHEREAS, Sauget is willing to permit the disposal of such refuse by Monsanto on Sauget's property upon the terms and conditions hereinafter set out,

NOW THEREFORE, it is hereby agreed by and between the parties hereto as follows:

Sauget agrees as follows:

- (a) To permit Monsanto to haul and dump at Monsanto's expense and risk any or all refuse resulting from the normal operations at Monsanto's chemical plant. Any refuse containing acid shall be neutralized with lime.
- (b) To maintain the dump at all times in such condition as to allow Monsanto to freely dump all refuse. Cinders will be furnished by Monsanto to assist in this maintenance as Monsanto deems necessary.
- (c) To maintain at all times access for trucks to the dump from the nearest improved road.

- (d) To hold Monsanto harmless from and indemnify Monsanto against any and all liability, loss or expense that might arise by reason of damage to property or crops or injury to person or persons resulting directly or indirectly from the operation of said dump, from materials deposited therein or from Monsanto's use thereof.

Monsanto agrees as follows:

- (a) To pay to Sauget at the end of each year that this agreement is in effect, the sum of Three Thousand Dollars (\$3,000.00).
- (b) To indemnify Sauget against any and all damage to Monsanto's equipment or injury to Monsanto's employees or agents while on the property of Sauget.

This agreement shall continue in effect for a period of one year from January 1, 1958, to January 1, 1959, and thereafter from year to year subject to the right of either party to terminate same at any time after January 1, 1959, by giving to the other party at least ninety (90) days' written notice of that party's intention to cancel same.

Should this agreement be terminated at any time other than at the end of a calendar year then payment shall be prorated on the basis of Three Thousand Dollars (\$3,000.00) per year.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed in triplicate the day and year first above written.

MONSANTO CHEMICAL COMPANY

LEO SAUGET

By: *Charles E. ...*

Vice President

Witness: *Chiers*

Date: December 11, 1957

By: *Leo Sauget*

Witness: *W. ...*

Date: Dec 14, 1957

VAULT COPY
Return to Office
of the Secretary

ATTACHMENT 6

INFORMATION ON POTENTIALLY RESPONSIBLE PARTIES (PRP)

- 1. PRP List - Area I**
- 2. Extracts from "Expanded Site Investigation, Dead Creek Project Sites At Cahokia/Sauget, Illinois", Ecology and Environment (May 1988):**
 - A. Site History (pp 2-41 to 2-68)**
 - B. Findings (pp 7-1 to 7-6)**
 - C. Site Specific Descriptions (Appendix A, pp G-1 to IA-6, L-1 to M-5, B-1 to C-5)**

2. EXTRACTS

A. SITE HISTORY

intake in the river. This intake is located at river mile 190, approximately 12 miles north of the DCP area. Residents in St. Louis County, Missouri, including all of the surrounding suburban areas, are serviced by the St. Louis County Public Water District, which utilizes intakes in the Missouri and Meramec rivers as water sources. According to the available sources, the nearest downstream surface intake on the Illinois side of the Mississippi River is located at river mile 110, approximately 65 miles south of the project area. This intake supplies drinking water to residents in the Town of Chester and surrounding areas in Randolph County, Illinois. The nearest potentially impacted public water supply on the Missouri side of the river is located at river mile 149, approximately 28 miles south of the DCP area. The Village of Crystal City, Missouri (pop. 4,000), located 28 miles south of the DCP area, utilizes a Ranney well adjacent to the Mississippi River as a source for drinking water. Although this is not actually a surface water intake, it is assumed that the well draws river water due to its construction and location adjacent to the river.

An assessment of irrigational use of groundwater and surface water in the DCP area was also conducted as part of the water supply search. Although agricultural land is found throughout the immediate project area, this land is apparently not irrigated. The nearest irrigated land, other than residential lawns and gardens, is located in the Schmids Lake-East Carondolet area. According to the University of Illinois Agricultural Extension Service, three wells in this area are used to irrigate approximately 400 acres of farmland. Approximately 1.9 mgd are withdrawn from water wells for irrigational use in St. Clair County (Kirk et al. 1982). Other than the three wells located in Schmids Lake-East Carondolet area, no specific information concerning the location of wells used for irrigation is available.

2.6 SITE HISTORY

The DCP area has an extensive and complex history of waste disposal activities. A brief history of individual project sites was previously outlined in a report titled "Description of Current Situation at the Dead Creek Project Sites," completed by E & E in July 1986 (provided as Appendix A). Because site histories were described in the July 1986

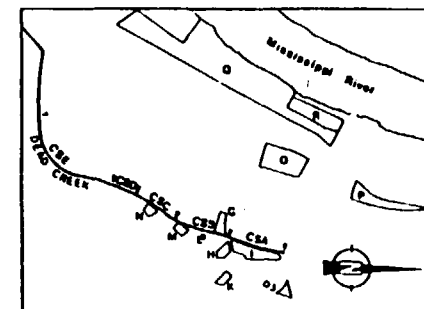
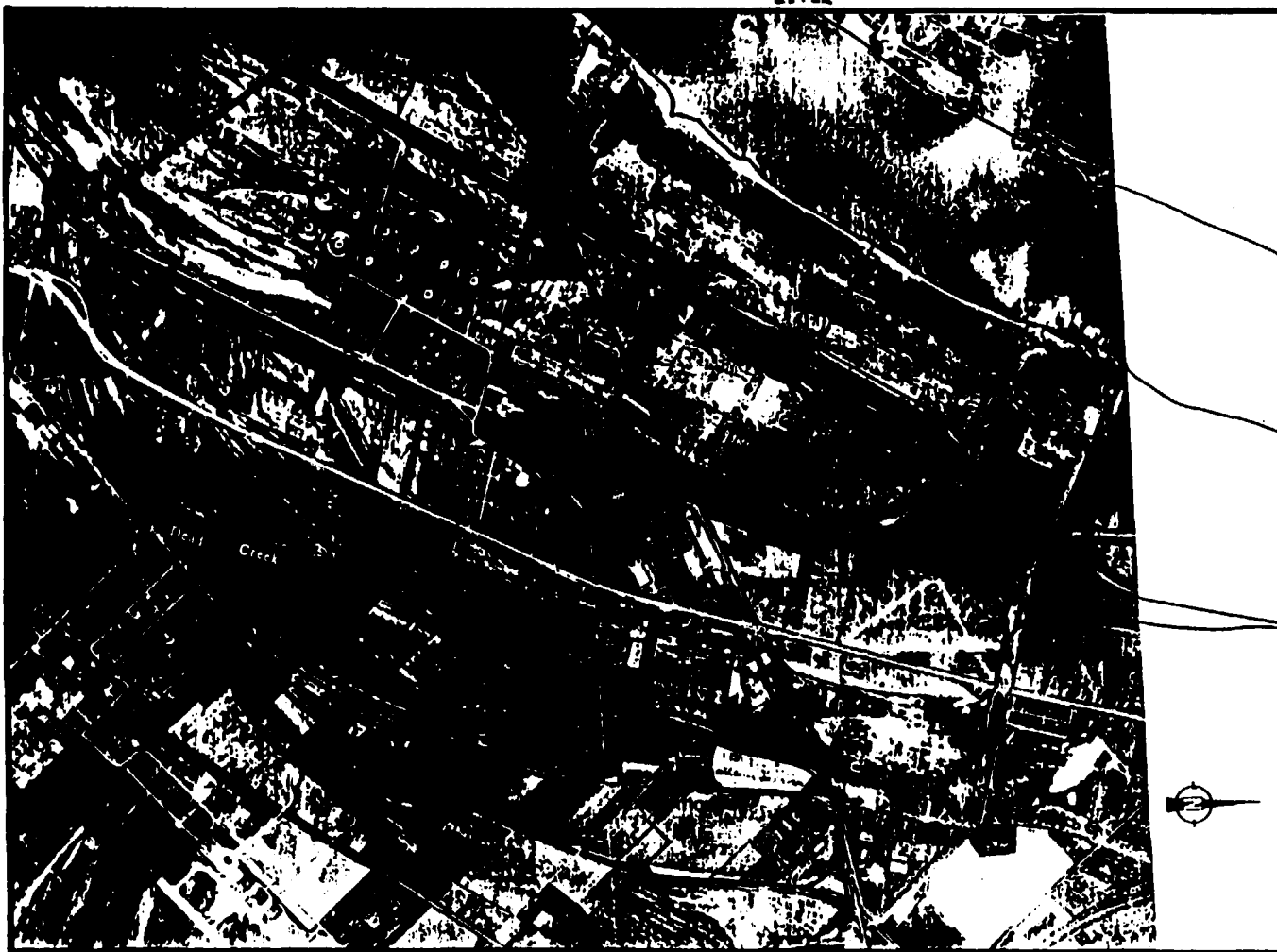
report, this section will be limited to a discussion of points not covered in the that report. Items specifically presented in this section will include: an examination of historical aerial photographs, a brief chronology of local investigations conducted by governmental agencies and area firms, and a discussion of site ownership at the time of disposal activities.

2.6.1 Analysis of Aerial Photographs

Historical aerial photographs were used initially by IEPA to identify potential sources of contamination observed in the DCP study area. These photographs also provided a chronology of disposal activities at the DCP sites. The photographs revealed several excavated areas which were thought to have been subsequently used for waste disposal activities. IEPA then conducted a preliminary hydrogeological investigation in the area and presented the findings, along with an assessment of the photographs (St. John 1981). In order to assess site conditions and to more accurately locate site boundaries, E & E obtained aerial photographs for the years 1937, 1950, 1955, 1962, 1973, 1978, and 1985. Results of this analysis were also used to determine placement of soil gas monitoring points, soil borings, and monitoring wells.

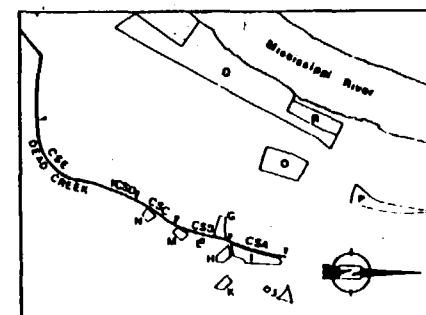
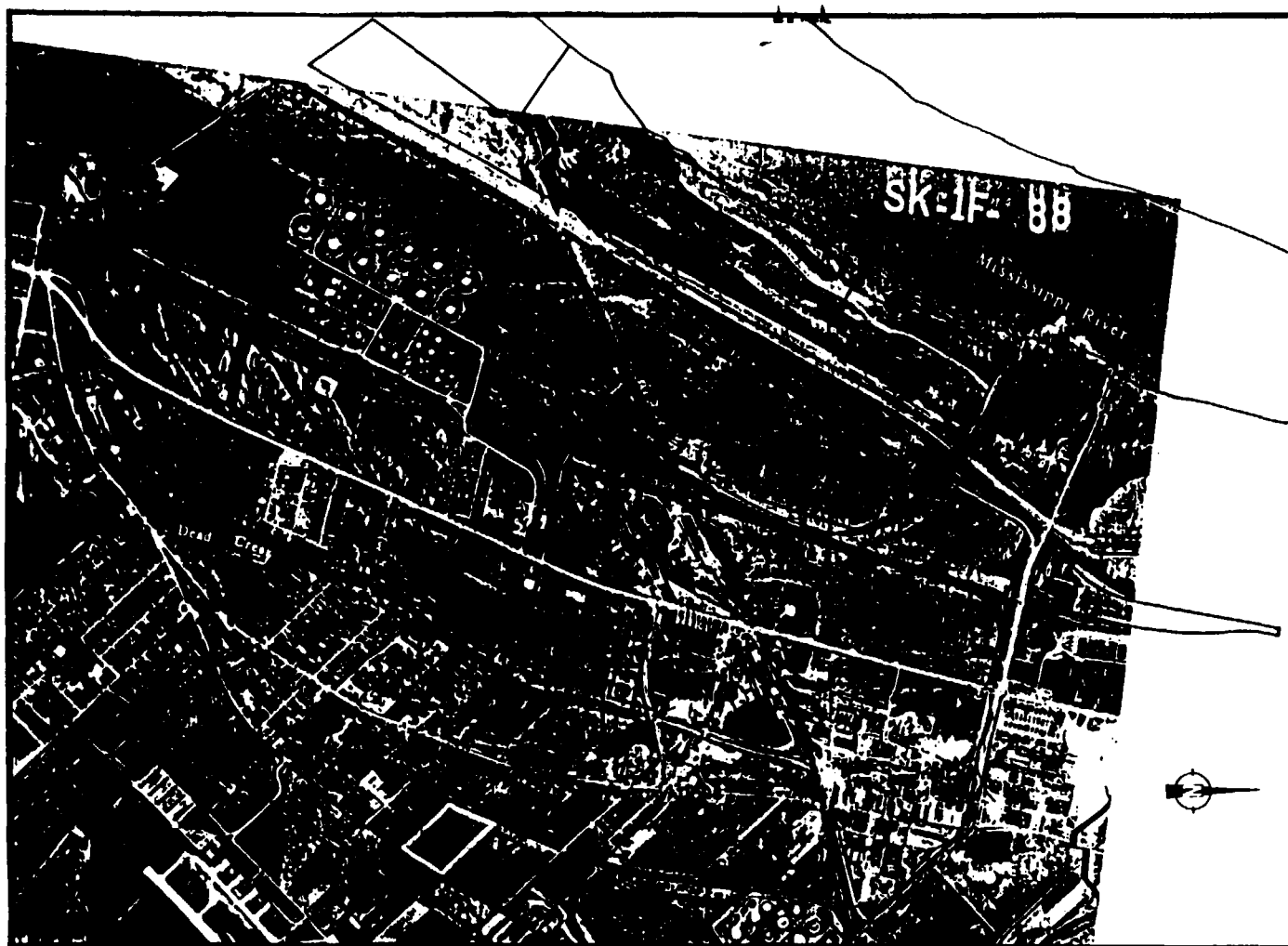
The aerial photograph from 1937 (see Figure 2-20) shows the project area with present site boundaries and distinguishing features superimposed on it. The Sauget area had been significantly industrialized at the time, indicating that some form of industrial waste disposal activity probably occurred in the area prior to 1937. The only current DCP sites evident in the photograph are Sites H and I, which were apparently undergoing initial excavation at the time. Queeny Avenue had not yet been constructed, and a single excavation extended north of Site H, across the present location of Queeny Avenue, and onto the southern portion of Site I (the present boundaries for Sites H and E were based on property ownerships and the separation of the areas by Queeny Avenue). Figure 2-20 also shows Dead Creek as an uninterrupted stream, with little activity along the banks of the creek.

The aerial photograph from 1950 (see Figure 2-21) shows significant change in the DCP area. Several additional excavations can be seen in the general area around Dead Creek, and industrial activity in the area



SITE LOCATION INDEX MAP

FIGURE 2-28 AERIAL PHOTOGRAPH
OF DCP AREA - 1937



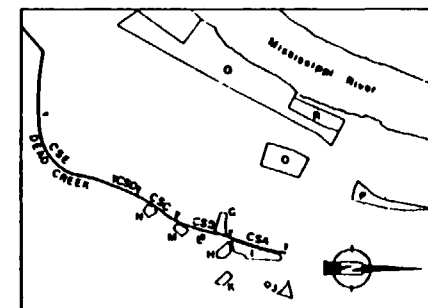
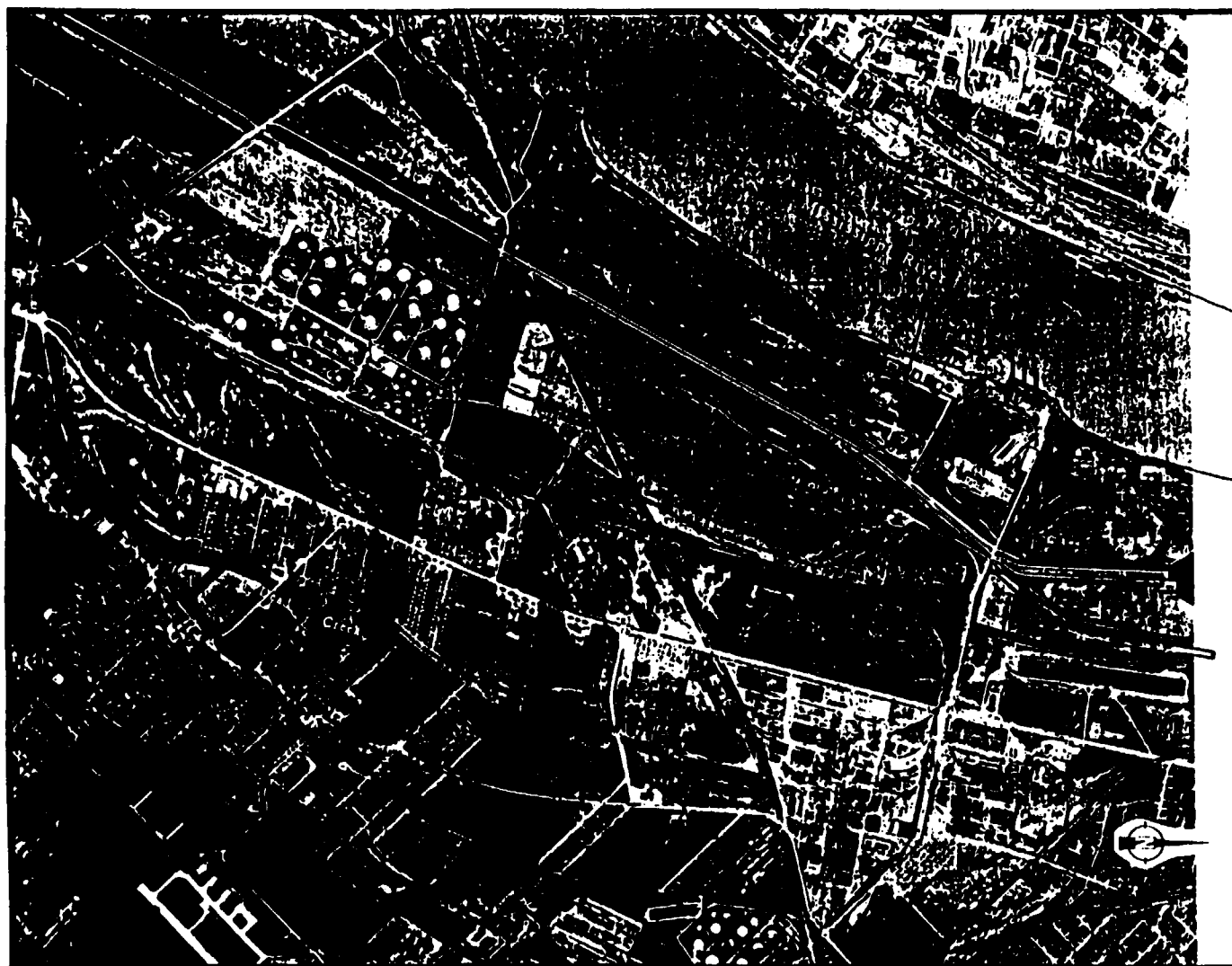
SITE LOCATION INDEX MAP

FIGURE 2-21 AERIAL PHOTOGRAPHY
OF DCP AREA, 1950

increased significantly. New excavations visible in the figure were located at the areas now designated as Sites G, I, K, M, and N. All of these pits were excavated into the water table, which was approximately 25 feet below ground surface at that time (Bruin 1953). The majority of Site H had been filled by 1950, with the exception of a small area in the northwest corner of the site. Queeny Avenue was completed by 1950. This construction divided the pit initially seen in the 1937 photograph. Marked discoloration can be seen in CS-A and the northern portion of CS-B, indicating disposal into the creek or runoff from the pits entering the creek. Residential development had also increased in the DCP area, particularly south of Site M along Dead Creek.

The aerial photograph from 1955 (see Figure 2-22) shows a new excavation in the eastern portion of Site J. The initial pit at Sites H and I had been completely filled, and the area appears to be low-lying in relationship to the surrounding topography, indicating that material in the pit had settled. Disposal activities continued in the northern part of Sites I and G. The excavations at Sites K, M, and N remained essentially unchanged, although the water table was no longer evident in any of the three sites. This is probably due to the large increase in groundwater pumpage between 1950 and 1955, which lowered the water table in the area between 5 and 10 feet. Residential development continued to increase, most notably on Walnut Street which is immediately east of Site M. Initial activity was also seen at Sites Q and R, adjacent to the Mississippi River.

The aerial photograph from 1962 (see Figure 2-23) shows a marked increase in what appears to be disposal activity at Sites Q and R. A tank farm had been constructed along the river adjacent to Site R. Several small excavated areas are seen in the northern portion of both sites, and waste material is evident along the east side of Site Q. Disposal activity continued at Site G, and the photograph shows the site expanded to the west toward Illinois Route 3. The north excavation at Site I and the pits at Site K and Site N had been filled. Site M did not change, although water is again evident in the pit. The initial excavation at Site J had increased in size, and a second pit is now seen to the north of the plant buildings at the site. Surface disposal is not evident at Site J in the 1962 photograph. The only remaining



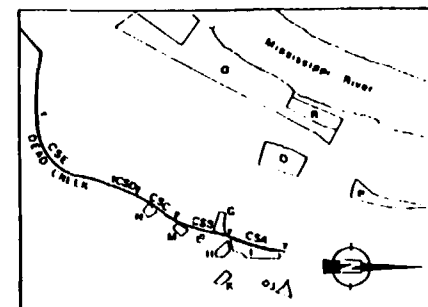
SITE LOCATION INDEX MAP

FIGURE 2-23 AERIAL PHOTOGRAPH
OF DCP AREA - 1962

project sites not active by 1962 were Sites L, O, and P. Discoloration is again seen in CS-A and CS-B, and dark stains are also evident along the west bank of CS-B in an area adjacent to Site G. These stains are distinguishable from the lighter discoloration mentioned previously, and are possibly the result of discharge from an effluent pipe reported to have been utilized by the Midwest Rubber Company.

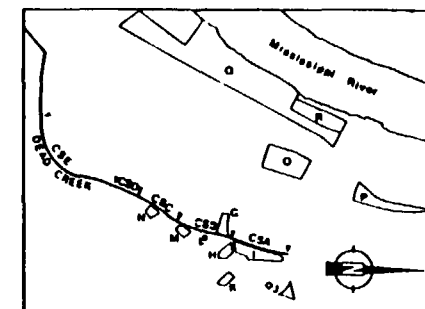
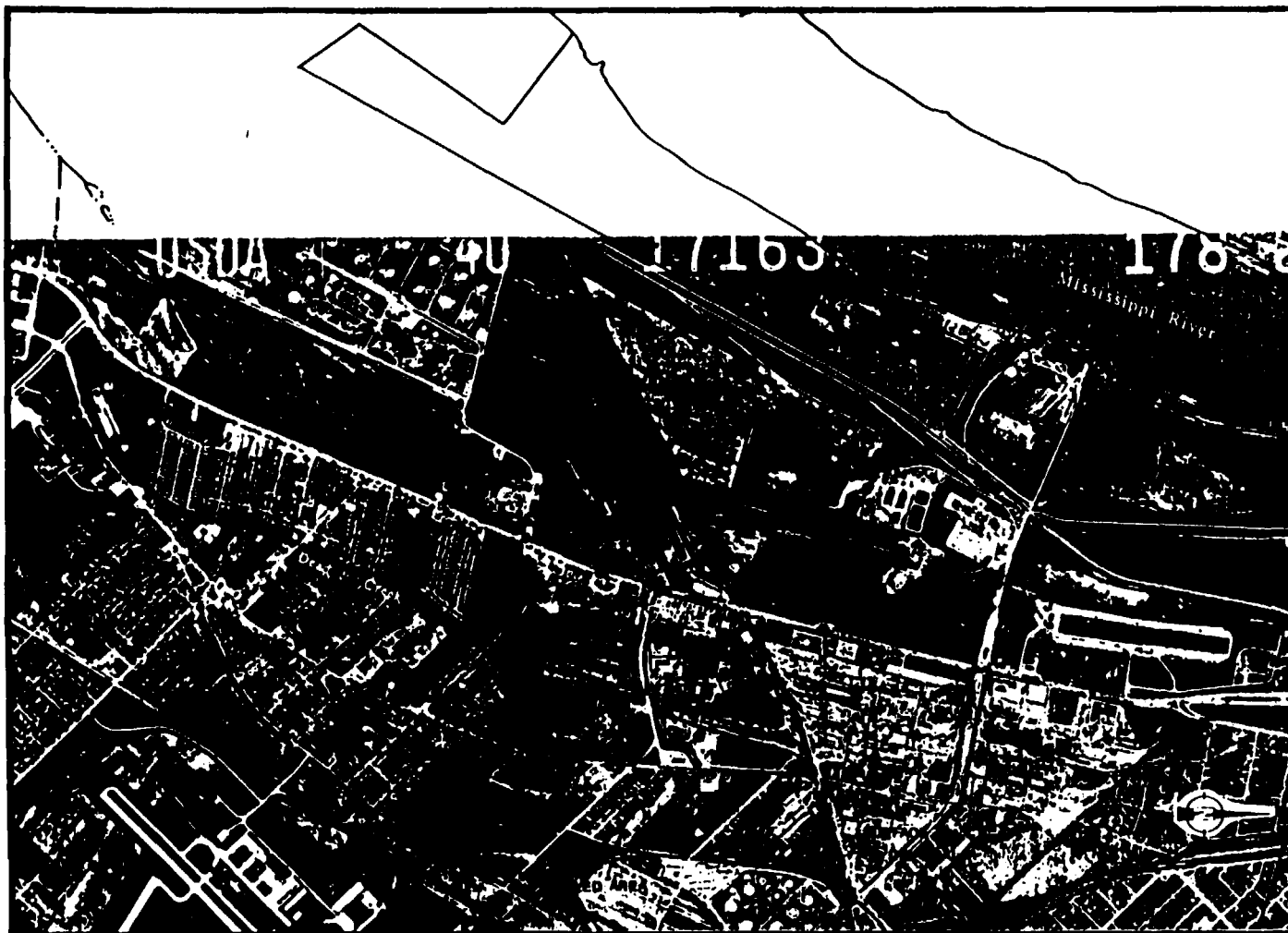
The aerial photograph from 1973 (see Figure 2-24) shows the first evidence of disposal activity at the three remaining project sites: Site L, Site O, and Site P. The former surface impoundment at Site L is clearly identifiable immediately to the north of a cultivated field. The water in CS-B is again discolored, particularly in the area adjacent to Site L. The sludge lagoons at Site O appear to have been active for several years, and a dark liquid or sludge-like material is visible in the two west lagoons. A large amount of excavation is seen at Site P, with dark staining evident in the south-central and eastern portions of the site. The present boundaries of Site R are defined, and significant liquid waste disposal is evident in the southern one-half of the site. Several individual cells, or bermed areas, are seen in this area. Disposal activities appear to have been completed in the northern portion of Site Q (adjacent to Site R), although landfilling continues to the south. With the exception of Site L, activity at the sites in the immediate Dead Creek area appears to have been completed. A building has been constructed along the west side of Site G in an area where previous photographs indicated waste disposal activity. Site I has been graded and is being used as a storage area. The large pit at Site J has been partially filled, but ponded water is still visible. Initial activity is also apparent in the surface disposal area to the northeast of the plant buildings at Site J. Although the excavation at Site K had apparently been filled previously (see Figure 2-23), activity is again seen in this area. A large pit had again been excavated, and a dark liquid (possibly water) is seen throughout the excavated area. Commercial and residential development in the area had approached present conditions.

The aerial photograph from 1978 (see Figure 2-25) again shows significant activity at Sites O and P. Disposal activities at Site Q and R appear to have been completed. Sites J and L remain unchanged.



SITE LOCATION INDEX MAP

FIGURE 2-24 AERIAL PHOTOGRAPH
OF DCP AREA - 1973



SITE LOCATION INDEX MAP

FIGURE 2-25 AERIAL PHOTOGRAPH
OF DCP AREA - 1978

The excavation at Site K has again been filled. Light-colored staining remained evident in CS-A and CS-B. This observation is consistent with complaints from local residents to IEPA concerning odors and discoloration in the creek during this time. The appearance of the remaining project sites shown on this figure resembles current conditions in the DCP area.

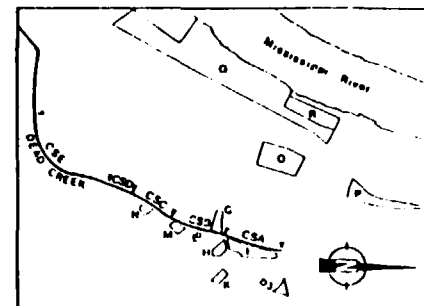
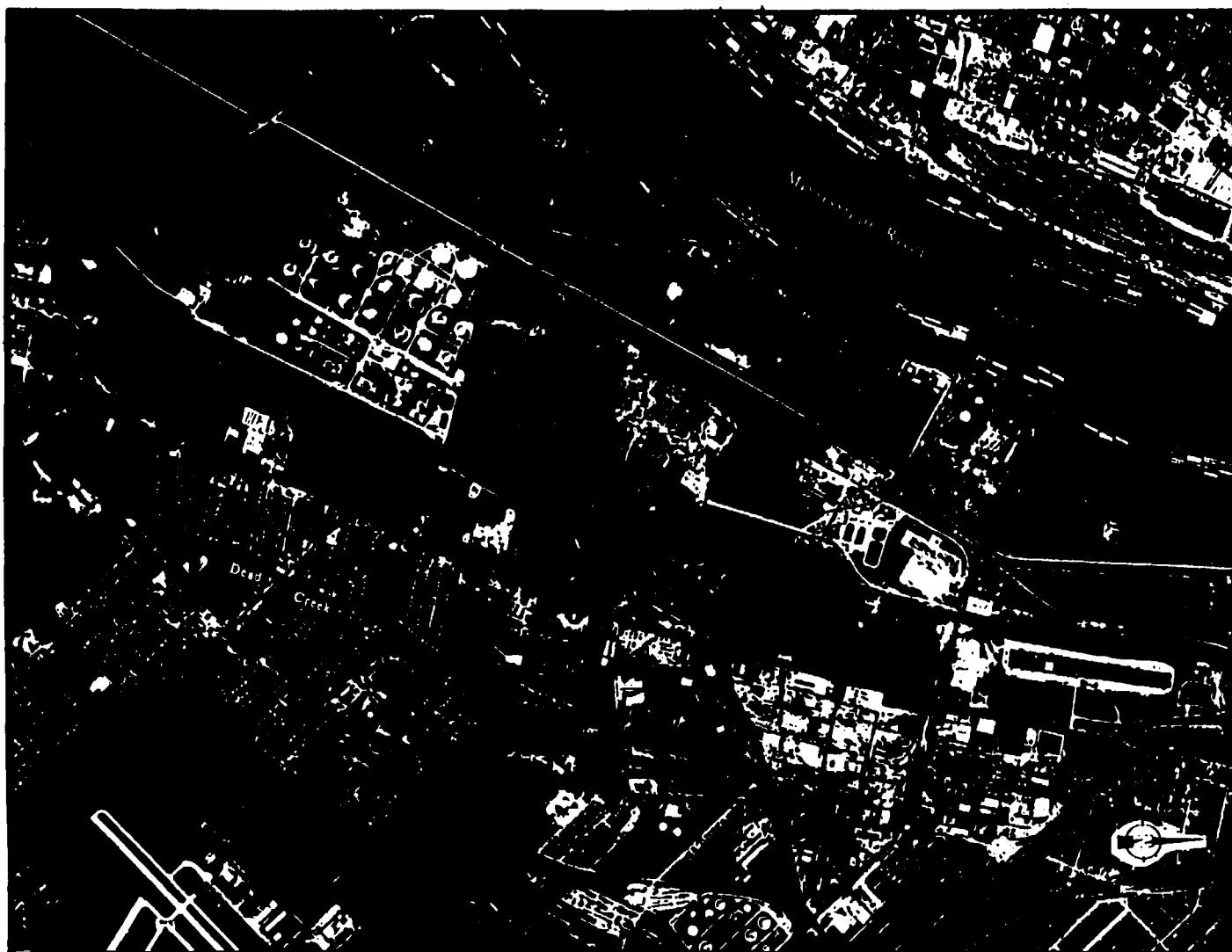
The aerial photograph from 1985 (see Figure 2-26) shows site conditions at the onset of this project. Waste disposal activities had been completed at all DCP sites. Sites showing waste material at the surface include Site G, Site J, and Site P. Site O and Site R had been capped and vegetated, and construction of the new regional wastewater treatment plant (south of Site O) underway. Large piles of coal and cinders are evident on the surface of Site Q. A building and parking area have been completed in the southeast corner of Site P. Water is still evident in the pits at Site J and Site M, and the impoundment at Site L had been filled.

It should be noted that the analysis of historical aerial photographs was limited to only those sites included in this study. Several other potential sources of contamination, such as the Route 3 Drum Site, are also evident in the photographs.

2.6.2 Chronology of Site Activities

The DCP area has a long history of investigation activity by government agencies and private consultants to area industries. A brief chronology of these activities, with references to specific project sites, is as follows:

March 1942	Correspondence from an Illinois Sanitary Water Board engineer represents the earliest available file information concerning waste discharge and contamination in Dead Creek and the Mississippi River.
March 1967	Sauget & Co. filed a registration application for disposal site (Site Q) to the Illinois Department of Public Health (IDPH).



SITE LOCATION INDEX MAP

FIGURE 2-28 AERIAL PHOTOGRAPH
OF DCP AREA - 1985

August 1968	IDPH sampled monitoring wells at Site R. Phenols detected in all wells sampled.
August 1968	In response to an IDPH request, Monsanto submitted a waste inventory of material disposed of at Site R. Inventory included 35,470 cubic yards of material, listed by chemical category.
March 1971	The Cahokia Health Department received complaints from area residents concerning chemical discharges to Dead Creek.
April 1971	IDPH inspection of Dead Creek (CS-B) indicated no apparent discharge from CS-A following the blockage of the Queeny Avenue culvert.
April 1971	IEPA inspection of Site R revealed disposal of bulk chemical waste and drums.
April 1971	IEPA inspector observed Waggoner Company (Site L) tank truck discharging material directly to Dead Creek.
May 1971	Illinois Pollution Control Board (PCB) order 71-29 issued to Sauget & Co. to respond to request for information concerning Site R, and to cease using cinders for final cover at Site Q.
June 1971	Monsanto responded to PCB order 71-29, listing 18,400 cubic yards of chemical wastes disposed of at Site R for the year 1971.
July 1971	IEPA cited Waggoner Company for discharges to Dead Creek.

August 1971	<u>Vaggoner</u> responded to IEPA, stating discharges to Dead Creek had ceased, and that the company was using a pit for discharges <u>(Site L)</u> at that time.
September 1971- August 1972	IEPA conducted monthly inspections at Site Q, citing inadequacy of daily and final cover, and disposal of liquid wastes.
August 1972	IEPA conducted leach tests of cinders used as cover at Site Q. Material determined to be inadequate due to high metal content and permeability.
December 1972	IEPA sampled monitoring wells at Site R. Phenols detected in all wells sampled.
January 1973	IEPA issued a <u>permit</u> to Sauget & Co. to operate landfill <u>(Site P)</u> . The landfill was authorized to accept only <u>non-chemical waste from Monsanto</u> .
January 1973	IEPA sampled waste ponds at Site R. Limited analysis showed high concentrations of phenols.
February 1973	IEPA sampled monitoring wells at Site R. High chemical oxygen demand (COD) and phenols were detected in all samples.
March 1973	Mississippi River floodwaters inundated Sites Q and R. IEPA observed waste material in the water. Conditions persisted until May.
November 1973	Illinois Secretary of State revoked the authority of Sauget & Co. to transact business in the State of Illinois.

May 1974	IEPA sampling of monitoring wells at Site R indicated phenols in all samples.
January 1975	IEPA inspection of Site Q indicated that disposal activities had been completed at the site.
May 1975	IEPA received a complaint concerning chemical contamination in Dead Creek. Inspection revealed discoloration of water and creek bank along CS-A and CS-B.
October 1975	IEPA inspection at Site P indicated disposal of chemical waste from Monsanto in violation of the site permit.
February 1976	IEPA sampled monitoring wells and high volume Ranney well at Site R. PCBs detected in Ranney well.
September 1976	IEPA inspection at Site Q revealed underground fire and smoldering at the site. Condition persisted for approximately 1 month.
August 1977	Monsanto submitted correspondence to IEPA indicating that the company had ceased production of PCBs at its Krummrich plant.
October 1977	D'Appolonia Consulting Engineers retained by Monsanto to conduct a subsurface investigation of Site R and propose appropriate closure alternatives.
December 1977	IEPA inspection at Site P indicated disposal of 25 metal containers of phosphorus pentasulfide. Monsanto ordered to remove the material.

May 1978	Monsanto submitted closure plan for Site R to IEPA.
August 1978	PCB order 77-84 filed against Sauget & Co. to apply final cover at Site Q.
September 1978	Monsanto began closure operations at Site R which included covering, grading, capping, and securing the site.
July 1979	Complaints received by IEPA concerning fires and smoldering in Dead Creek (CS-B).
October 1979	Monsanto cited by IEPA for disposal of chemical packagings at Site P in violation of permit issued January 1973.
October 1979	IEPA sampled monitoring wells at Site R. Analysis revealed contaminants including chlorophenols, chlorobenzenes, and aniline derivatives in the samples.
October 1979	IEPA inspection at Site R indicated that closure operations at the site had been completed.
May 1980	IEPA received notice that chemical wastes and drums were uncovered during excavation work for a railroad spur at Site Q. File information indicates that construction workers at the site became nauseous; however, specific information concerning exposure-related illness has not been located.
May 1980	IEPA received additional complaints concerning fires in Dead Creek.

June 1980	IEPA and the University of Illinois conducted a joint investigation of effluents from industrial plants and water treatment plants. The report of this investigation indicated the presence of several mutagenic contaminants in the Sauget Waste Water Treatment Plant effluent.
August 1980	Incident in which local resident's dog died, apparently resulting from exposure to contaminants in the creek bed, reported to IEPA.
August 1980	The U.S. Food and Drug Administration (FDA) collected fish samples from the Mississippi River near Site R and the Sauget Waste Water Treatment Plant discharge point. Analysis of the samples indicated the presence of several PCB congeners and pesticides in downstream fish.
September 1980	IEPA surface water/sediment sampling revealed high concentrations of a wide variety of organic and inorganic contaminants in Dead Creek (CS-B through CS-E).
September 1980	IEPA placed a seal order on Dead Creek (CS-B and Site M), and the Illinois Department of Transportation (DOT) completed construction of a snow fence with warning signs around the area.
October 1980	IEPA conducted additional sediment sampling in the creek bed (CS-B) in conjunction with Monsanto. Results revealed widespread contamination in the area.
October 1980	IEPA initiated a hydrogeologic investigation in the Dead Creek area in order to determine the source(s) of contamination in the creek.

October 1980	IEPA collected air samples in the creek bed (CS-B). Results were not quantified, but revealed the presence of volatile organics and hydrocarbons.
October 1980	The Illinois Attorney General's office interviewed area residents who discussed past operation of several disposal pits in the area that reportedly received chemical wastes.
November 1980	IEPA sampled water and sediments in CS-A on Cerro Copper Products property. Results indicted high concentrations of PCBs and hydrocarbons.
December 1980	USEPA and TAT contractor inspected CS-B for possible 311 immediate removal action. Not deemed to be warranted.
March 1981	IEPA sampling of monitoring wells at Site R revealed high concentrations of a variety of organic contaminants.
March 1981	Following a long history of effluent problems, the Sauget Waste Water Treatment Plant submitted specifications for a pretreatment program to more efficiently treat its waste streams.
April 1981	IEPA completed report on hydrogeologic investigation in the Dead Creek area. Results indicated widespread groundwater and soil contamination. Report concluded that further investigation was necessary.
May 1981	Illinois Attorney General filed suit against Sauget & Co., alleging several violations of the Illinois Environmental Protection Act (Site Q).

May 1981	Monsanto filed CERCLA notification for the Sauget (Monsanto) Illinois Landfill on Falling Springs Road (Sites H and I). Also submitted notification for Site R.
June 1981	The Village of Sauget submitted CERCLA notification for former sludge lagoons (Site O). Notification indicated that lagoons had been neutralized and clay-capped.
August 1981	Patterson & Associates report outlined major discharges to the Mississippi River in the Sauget area, and indicated a discharge of 30 organic priority pollutants expected to exceed 0.5 million pounds.
September 1981	USEPA formed a Sauget task force to investigate past and present waste disposal activities in the area. The task force conducted limited investigations and interviews at Sauget area industries. Results from these investigations are described individually in this chronology (see USEPA investigations between 1981 and 1983).
October 1981	U.S. Food and Drug Administration collected fish samples from river upstream and downstream of Site R. Downstream fish contained several organic contaminants.
October 1981	IEPA sampled seeps adjacent to river at Site R and Site Q. Results showed high concentrations of organics.
November 1981	USEPA TAT contractor sampled seeps at Site R. Higher chlorinated dioxins (hexa- through octa-) found in samples.

December 1981 IEPA issued supplemental permit to Sauget and Company to alter landfill operation at Site P due to the presence of a potable water line discovered in the center of the site. The water line remains in its original location. Considering the widespread groundwater contamination in the Sauget area, the water line may eventually be impacted by the presence of contaminants.

December 1981 Monsanto retained Law Engineering Company to drill additional test borings at Site R.

January 1982 USEPA FIT contractor conducted property search to determine the ownership of various waste disposal sites in the Sauget area.

March 1982 USEPA collected private well and garden soil samples at residences in the Dead Creek area. Results showed little contamination. Also sampled sediments in CS-A and well on Cerro Copper Products property. Organics detected in groundwater sample. Sediments showed concentrations of lead and cadmium above EP-toxicity limits.

March 1982 USEPA FIT contractor conducted air monitoring in CS-B. Organic vapor readings up to 900 ppm detected.

March 1982 USEPA sampled treatment plant effluent at the Mississippi River. Results indicated high levels of organic pollutants discharged to the river.

June 1982	Illinois Attorney General's office filed complaint against Monsanto, alleging several violations of the Illinois Environmental Protection Act.
July 1982	USEPA FIT contractor submitted HRS score for Site R. Site scored 7.23 and did not qualify for the NPL.
July 1982	Illinois Attorney General's office conducted a property search in support of proposed action at disposal sites.
October 1982	USEPA completed construction of chain-link fence around CS-B and Site M, replacing snow fence originally constructed by the IEPA.
December 1982	IEPA collected soil samples around Bliss Waste Oil tanks at Clayton Chemical in the vicinity of Site O. High levels of PCBs and pentachlorophenol detected. Dioxin contamination suspected.
January 1983	Construction began on the new American Bottoms regional wastewater treatment plant.
January 1983	Illinois Attorney General's office filed suit against Bliss and Clayton Chemical. Alleged water pollution hazard.
February 1983	IEPA inspected reported underground tank at Bliss and Clayton, near Site O. Analysis of samples from tank showed high levels of organics.

February 1983	IEPA and Envirodyne Engineers soil sampling revealed PCB and 2,3,7,8-TCDD (dioxin) contamination in an area northwest of Site 0 at the Sauget Waste Water Treatment Plant.
March 1983	FDA completed an investigation of contamination in Mississippi River fish in the St. Louis area. The report indicated the presence of organic contaminants in fish up to 150 miles south of the Sauget area, and concluded that the contaminants detected (chlorinated nitrobenzenes) were directly attributable to discharges in the Sauget area.
April 1983	Clean-up plan for dioxin-contaminated soils submitted and approved by IEPA/USEPA.
June 1983	IEPA ordered the excavation of underground tank owned by Bliss, situated on Clayton Chemical property. Tank found to be ruptured. Soil and waste samples collected by IEPA.
June 1983	USEPA FIT contractor initiated subsurface investigation at Site Q. Sixty-three of 112 organic compounds analyzed for detected in subsurface soil samples. 2,3,7,8-TCDD detected in two samples.
August 1983	Based on the results of previous sampling, IEPA ordered excavation of additional soil from excavation of Bliss underground tank.
October 1983	G & M retained by Monsanto to conduct a detailed hydrogeologic investigation of Monsanto property in Sauget, including Site R.

October 1983	IEPA received numerous complaints from area residents concerning contamination in Dead Creek.
May 1984	Wastes in lagoon area at Site O were uncovered by workers excavating a trench for a water line to the new treatment plant. Trench was covered, and water line was installed above ground. No reports of exposure-related illness resulting from this incident have been located.
July 1984	G & M initiated a hydrogeologic investigation at Site O to characterize the influence of the former sludge lagoons on area groundwater.
July 1984	Monsanto applied for a permit to construct a revetment along the bank of the Mississippi River at Site R. Revetment installed some time in 1985.
August 1984	Contaminated soils were encountered by workers at Site O during excavation for construction of transfer sewer. Soil sampling by private consultant revealed high concentrations of phenols and PAHs. No reports of exposure-related illness resulting from this incident have been located.
October 1984	IEPA conducted inspections at Site G and CS-B in order to determine scope of proposed cleanup at the sites. Samples from oily pits at Site G revealed a variety of organics.
December 1984	IEPA submitted HRS for Dead Creek and surrounding sites. Score of 29.23 was not accepted by USEPA due to lack of documentation.

December 1984	IEPA selected a contractor for a limited scope cleanup at Site G and CS-B. IEPA later reconsidered cleanup, and decided to delay activity until a detailed investigation of the area was completed.
December 1984	IEPA received an anonymous phone call indicating that it would be dangerous to excavate Site G due to the presence of underground toxic wastes.
January 1985	IEPA began procurement activities to select a consultant to perform an SI in the Sauget area.
March 1985	Illinois Attorney General's office reentered suit against Sauget & Co. Ordered final cover to be applied at Site Q and requested civil penalty.
June 1985	Petition from area residents sent to Illinois Governor James Thompson's office requesting cleanup of Dead Creek. "Clean Illinois" money appropriated for SI.
July 1985	IEPA selected consultant (E & E) to conduct SI at the 12 disposal sites and Dead Creek.
October 1985	E & E conducted preliminary geophysical investigations and topographic mapping at the DCP sites.
August 1986	E & E submitted proposed scope of work revisions directed toward HRS scoring to the IEPA. FS portion of the investigation postponed.
September 1986	Initial G & M report on hydrogeologic investigation for Monsanto properties submitted to IEPA. Report estimated load of 77 pounds per day of organic contaminants to river from Site R.

October 1986 E & E initiated field investigations at the DCP sites. Soil gas monitoring indicated widespread contamination at Area 1 sites.

November 1986 E & E soil sampling revealed extremely high concentrations of organics, particularly PCBs, in surficial soils at Site G.

December 1986 G & M completed report on investigation at Site O. Report outlined the extent of groundwater contamination attributable to the former sludge lagoons.

May 1987 USEPA emergency response investigation led to the construction of a fence around Site G, restricting access to the site. The fence was constructed by Monsanto under the supervision of USEPA.

October 1987 E & E completed field investigations at the DCP sites.

March 1988 E & E submitted first draft of SI report for IEPA review.

It must be noted that this chronology is not a complete list of activities at the DCP sites. An attempt was made to highlight significant investigation activities or occurrences at the sites, while omitting routine inspections and other less significant activities.

2.6.3 Historical Site Ownership

In order to develop a more accurate picture of the history of waste disposal activities at the DCP sites, a historical property search was conducted to determine the ownership of sites at the time disposal activities were occurring. Sites for which file material contained sufficient information on owners/operators were not researched. The

historical property search was focused around the Dead Creek area sites, including Sites G, H, I, and K. Disposal operations at these sites predated the enactment of regulatory controls, and as a result, no records are available concerning the owner/operator of the sites. Due to the large number of transactions for several properties, many records were incomplete or missing for certain dates of interest. However, property ownership in the period relevant to disposal activity was obtained for each of the sites in question. A summary of property ownership of the DCP sites relative to disposal operations is presented in Table 2-1.

2.7 WASTE CHARACTERIZATION

The majority of the DCP sites were used for the disposal of both general refuse and industrial wastes. Since many of the sites have been inactive for 15 years or more, a comprehensive list of wastes accepted at the sites is not available. Monsanto submitted inventories of waste material disposed of at Site R to IEPA on two occasions. These inventories are the only detailed listings of waste types for the DCP sites. Because Monsanto has a file policy to destroy records older than 5 years, complete information concerning waste types and volumes is not available. Waste treatment sludge was disposed of in the lagoons at Site O. Due to the nature of the influent to the Sauget Waste Water Treatment Plant (over 90% from area industries, with Monsanto being the largest single contributor), and the long history of contaminated effluent from the plant, it is likely that the sludge at Site O contained many of the same waste types listed on the inventories for Site R. Site P was a solid waste disposal facility permitted by the IEPA to accept only nonchemical waste from Monsanto. However, several IEPA inspection reports indicate that chemical wastes were disposed of at Site P. On one occasion, Monsanto was required to remove approximately 25 metal containers labeled phosphorus pentasulfide from the site. Site P also received a supplemental permit to accept metal-bearing filter cake waste from Edwin Cooper, Inc. (now Ethyl Corp.). Site Q also reportedly accepted chemical wastes, although no specific information is available concerning waste characteristics.

Table 2-1

PROPERTY OWNERS/OPERATORS DURING PERIOD OF DISPOSAL OPERATIONS

Site Design.	Approx. Years of Operation	Owner(s) at Time of Operation	Present Owner(s)	Source
G	1950-1973	Lee and Louise Saugeat-part (until 1966) Myrtle Mankins Present Cerro property-unknown	Cerro Copper Products Co. Wiese Engineering Co. Emily Mankins, Myrtle Mankins	Property search
H	1937-1957	Lee and Louise Saugeat (1948)	J. D. Tolbird (Roger's Cartage Co.)	Property search
I	1937-1957	Lee and Louise Saugeat (1948)	Cerro Copper Products Co.	Property search
J	1955	Sterling Steel Co.	St. Louis Steel Co. (Sterling Steel Foundry)	Property search, personal communication
K	1950-1973	Lee and Louise Saugeat (1957)	Bank of Belleville (Trust property for Yvonne Saugeat)	Property search
L	1971-1979	Waggoner Trucking Co. (Harold Waggoner)	Tony and Velma Lechner (Metro Construction Equipment Co.)	IEPA file, personal communication
M	1950-	M. H. Hall Construction Co.	Thomas Owen	Property search

Table 2-1 (Cont.)

Site Desig.	Approx. Years of Operation*	Owner(s) at Time of Operation	Present Owner(s)	Source**
N	1950-1962	N.H. Hall Construction Co.	N. H. Hall Construction Co.	Property search, personal communication
O	1967-1970	Village of Sauget	Village of Sauget	IEPA file, property search
P	1972-1984	Illinois Central Gulf R.R. (until 1979) Paul Sauget Union Electric Co.	Bank of Belleville for (Trust property for Paul Sauget) Union Electric Co.	IEPA file
Q	1962-1975	Cahokia Trust-Paul Sauget	Riverport Terminal & Fleetng Co. (leased to Pillsbury Co.)	IEPA file
R	1957-1974	Monsanto Chemical Co.	Monsanto Chemical Co.	IEPA file

* Where available, years of operation are based on file material.
If file information was not available, years were based on review of historical aerial photos.

** Property search was conducted at the St. Clair County Tax Assessor's office in Belleville.
Other sources include: IEPA file material with specific reference to property ownership
(correspondence, permit applications, enforcement documents), or personal communication with
present site owners or operators.

Source: Ecology and Environment, Inc. 1988.

B. FINDINGS

7. FINDINGS AND CONCLUSIONS

7.1 INTRODUCTION

This section presents the findings of the background data search and field investigations for the DCP and the subsequent conclusions concerning the nature and extent of contamination at the DCP sites and creek sectors. These findings and conclusions are intended to be used to support future Hazard Ranking System (HRS) scoring efforts and to support future remedial activities at the sites.

7.2 FINDINGS

7.2.1 Background Information and Site Features

The findings of the background data search provide a historical perspective of the DCP sites and summarize site features. The findings are intended to support subsequent HRS scoring by showing that disposal activities at the various sites are related by common ownership, operators, and generators, thereby substantiating site aggregation. The DCP sites are aggregated into three groupings: Area 1 (Sites G, H, I, and L, and CS-A and CS-B), Area 2 (Sites O, Q, and R), and Peripheral Sites (Sites J, K, M, N, and P and CS-C and CS-D).

In general, waste disposal activities at the DCP sites followed a historical progression from the Area 1 sites to the Area 2 sites (see Section 2). For the most part, disposal activities, if any, at the peripheral sites appear to be unrelated to those at Area 1 and Area 2 sites. Findings of the background data search are presented under separate headings for the three site aggregates.

- Previous investigations and sampling have indicated common contaminants, including phenols, chlorophenols, chlorobenzenes, PAHs, and PCBs at all DCP Area 1 (Sites G, H, I, and L; CS-A and CS-B) and Area 2 (Sites O, Q, and R) sites and creek sectors. All of these compounds were listed on the waste inventories submitted by Monsanto for Site R, or are manufacturing byproducts of compounds listed on the inventories.
- Previous investigations have indicated general groundwater contamination across the majority of the DCP area. Several of the DCP sites, including Sites G, H, I, L, O, Q, and R, have previously been implicated as source areas for groundwater contamination in the area.
- Chemical waste material is present on the surface only at Site G. Slag, casting sand, and other industrial refuse/fill is present on the surface at Sites J, N, and P. The remaining project sites were subsurface disposal areas or impoundments that have since been covered with various fill material.

CS-A
I

Area 1

- Historical aerial photographs show a single excavation across current DCP sites H and I. The excavation was subsequently bisected by the construction of Queeny Avenue. A second pit was excavated at Site I after the initial pit was filled.
- Disposal activities at Sites G, H, and I occurred concurrently between the years 1940 and 1955. Each property was owned in whole or in part by Leo and Louise Sauget during the years of operation.
- Monsanto submitted CERCLA "Notification of Hazardous Waste Site" forms to USEPA in 1980 for the Sauget (Monsanto) Illinois Landfill on Falling Springs Road in Sauget. The forms listed disposal of organics, inorganics, solvents, and unknown wastes, and indicated below-ground disposal of drums. The years of oper-

ation for the facility listed on the forms were unknown to 1957. The pre-1957 time frame corresponds with the time frame for activities at Sites H and I indicated by historical aerial photographs.

- Historical aerial photographs indicate evidence of waste material being discharged to CS-A before 1950. Staining is evident in photographs of CS-A since that time. Presently, only surface and roof drainage from the Cerro Copper Products Company plant is discharged into CS-A. Water in CS-A is currently directed to an interceptor at the north end of the Cerro property, and is eventually discharged to the Sauget Waste Water Treatment Plant. Water in CS-A is currently extremely discolored and oily, and dark staining is evident along the entire length of the creek bank. Flow from CS-A to the south is restricted by a blocked culvert under Queeny Avenue.
- Historical aerial photographs also show evidence of direct discharge of waste material to CS-B. Staining is currently evident in the northern one-half of CS-B. A rubbery material covers the creek bed in an area approximately 150 feet south of Queeny Avenue, substantiating reports that effluent from the Midwest Rubber Company was previously discharged to CS-B. Water is present in the northern one-half of CS-B only after periods of moderate to heavy precipitation. Water is present at all times in the southern one-half of CS-B. The entire length of CS-B is choked with vegetation. The vegetation restricts flow in the creek. CS-B and Site M are currently enclosed by a chain-link fence, which was constructed as a response to the high levels of contamination observed in CS-B during the 1980 IEPA investigation. Flow from CS-B to the remainder of Dead Creek is restricted by a blocked culvert under Judith Lane.

Area 2

- Disposal operations occurred concurrently at current DCP Sites Q and R. Historical aerial photographs indicate the presence of

liquid waste material at both sites. According to IEPA file information, both sites were operated by Sauget and Company.

- Monsanto Chemical Company owns the property which constitutes DCP Site R, and disposed of liquid chemical wastes at the site between the years 1957 and 1974. - Monsanto submitted inventories of wastes disposed of at the site for the years 1968 and 1971 to IEPA, which listed specific chemical compounds and derivatives.
- The Sauget Waste Water Treatment Plant has processed effluent from Sauget industries since approximately 1965. Monsanto has been the largest single contributor to the plant since that time. Between the years 1965 and 1978, the treatment plant disposed of all or part of its clarifier sludge into a series of lagoons (current DCP Site O). The treatment plant has had a long history of contaminated effluent. Phenol, chlorobenzenes, aniline derivatives, PCBs, and mercury have consistently been detected in plant effluent.
- Previous investigations and sampling have indicated unrestricted flow of contaminated leachate and groundwater to the Mississippi River in the area of Sites Q and R. This discharge, in combination with the discharge of contaminated effluent from the Sauget Wastewater Treatment Plant, has led to a general degradation of water quality in the river, and has contaminated fish in the river. Food and Drug Administration fish sampling indicated the presence of contaminants from the DCP area in fish collected as far as 100 miles downstream (see Appendix A).

Peripheral Sites

- Historical aerial photographs show excavated areas at current DCP Sites J, K, M, and N. With the exception of Site M, which was investigated during IEPA's 1980 study, no file information was available for these sites.

- The larger of the two excavations at Site J has been partially filled with casting sand, slag, and demolition debris. This pit is excavated below the water table, and fill material is in contact with the groundwater. A triangular area to the northeast of the foundry buildings at Site J is also covered with casting sand, slag, and construction debris.
- The former pit at Site K was excavated on two separate occasions. The excavation was initially seen in the 1950 aerial photograph. This initial excavation was filled prior to 1962, as evidenced by the photographs. The same area was again excavated sometime prior to 1973, and a dark liquid or dark staining is evident in the photograph from that date. The excavation had again been filled by 1978. Site K is located adjacent to a small residential area.
- The excavation at Site M was initially seen in the aerial photograph from 1950. Water was evident in the pit in all except the 1955 photograph, suggesting hydraulic connection between the pit and groundwater at that time. However, water was again seen in the pit in 1962, when groundwater pumpage in the area reached a peak of approximately 36 million gallons per day. Site M is presently enclosed by a chain-link fence. Household debris is scattered across the bank of the pit in the northeast corner. Flow between the pit and the southern portion of CS-B occurs through a break in the creek bank near the southwest corner of Site M. No evidence of disposal activity in the pit was seen in historical aerial photographs, and the pit has remained essentially unchanged since it was initially excavated.
- The pit in the southwest corner of Site N was initially excavated sometime prior to 1950. The pit has been partially filled with construction debris, but the area remains below grade as compared with the surrounding topography. The property on which the pit is located is currently used by the H.H. Hall

C. SITE SPECIFIC DESCRIPTIONS

SITE G. ABANDONED LANDFILL

Site Description

Site G is a former subsurface/surface disposal area which occupies approximately 4.5 acres in Sauget, Illinois. The site is bordered on the north by Queeny Avenue; on the east by Dead Creek; on the south by a cultivated field; and on the west by Wiese Engineering Company property.

The surface of Site G is littered with demolition debris and metal wastes. Several small pits have been observed in the northeast and east-central portions of the site. Oily and tar-like wastes, along with scattered corroded drums, are found in these areas. Additionally, 20-30 deteriorated drums are scattered along a ridge running east-west, near the southern perimeter of the site. The western portion of Site G is marked by a mounded area with several corroded drums protruding at the surface. A large depression is found immediately south of the mounded area. This depression receives surface runoff from a sizable area within the site. Also, exposed debris is present over most of the site. In areas where wastes are not exposed, flyash and cinder material has been used as cover.

Site History and Previous Investigations

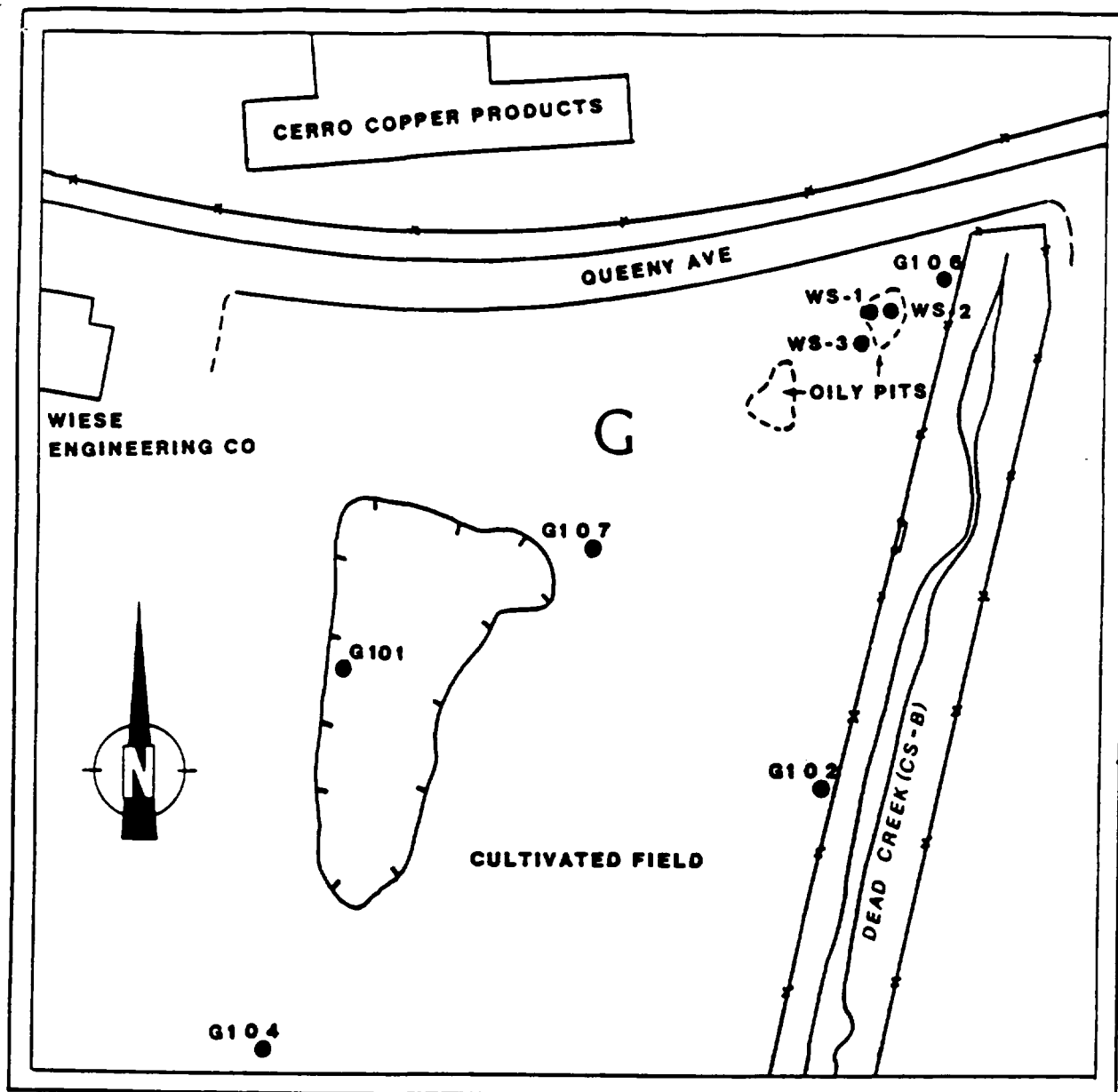
Examination of historical aerial photographs indicates excavation at Site G began sometime prior to 1950 and disposal operations were initiated shortly thereafter. No information is available concerning owners or operators for Site G at the time disposal was occurring. The photographs suggest disposal activities at the site continued until the early 1970s. Presently, Site G is inactive, although recent observations suggest that random dumping of various non-chemical wastes continues.

Site G was previously studied by the Illinois EPA in 1980 and 1981 as

part of an area-wide study to determine the source of contamination found in Dead Creek.

The results of this study were reported in the Preliminary Hydrogeological Investigation in the Northern Portion of Dead Creek and Vicinity in 1980-1981 (St. John Report). Locations of samples collected to date in the vicinity of Site G are shown on Figure G-1. The IEPA study completed in 1981 included collecting samples from subsurface soils and groundwater at Site G, and collecting surface water and sediment samples from Dead Creek immediately east of the site. Monitoring well G106 was installed in the northeast corner of the site, and well G107 is located approximately 50 feet south of Site G in a surface depression. In addition, wells G101 and G104 were installed southwest of the site as part of the general area investigation. Analytical data for these wells are presented in Tables B-6, B-7, and B-8, located in the Creek Sector B portion of this report. Several organic contaminants were detected at elevated levels in well G107. These include chlorophenol, chlorobenzene, dichlorophenol, dichlorobenzene, and PCBs. PCBs were also detected in samples collected from well G106. Both of these wells showed concentrations of heavy metals; specifically arsenic, barium, copper, lead, and manganese, which exceeded IEPA water quality standards. Phosphorus also exceeded the standards in both wells. Wells G101 and G104 showed little evidence of contamination although trace levels of PCBs were found in G101. Preliminary surveillance in November, 1985 at Site G showed wells G101, G104, and G107 to be intact. Well G106 was not located, and is suspected to have been destroyed.

In order to determine the vertical distribution of contaminants in the area, the IEPA collected subsurface soil samples at the locations of wells G106 and G107. Analytical data from these samples is shown in Table G-1. High levels of metals and phosphorus were detected in all samples. Trace levels of PCBs were found to a depth of 13 feet at G106. A quantified level (0.62 ppm) of PCBs was found at a depth of two feet in the location of G107, but PCBs were not detected in deeper samples. In October, 1984, IEPA collected three soil samples



0 100 500 FEET
SCALE

LEGEND
G106 IEPA MONITORING WELL
WS-1 IEPA WASTE SAMPLING LOCATION

FIGURE G-1
DEAD CREEK SITE AREA G WITH SAMPLE LOCATIONS

TABLE G-1: ANALYSIS OF SURFACE SOIL SAMPLES
FROM SITE 6 (COLLECTED BY JEPN IN 1980)

PARAMETER	SAMPLE LOCATION AND DEPTH													
	7.5'-9.0'	10'-11.5'	12.5'-13'	15.5'-17'	18'-19.5'	20'-21.5'	30'-31.5'	0.5'-2'	5'-6.5'	10.5'-12'	15.5'-17'	18'-19.5'	20.5'-22'	25.5'-27'
Copper	140	50	59	54	56	28	14	94	53					
Iron	12,600	12,300	10,400	9,700	13,600	5,700	4,700	21,200	21,900					
Lead	15	11	8	9	12	3	6	170	49					
Nickel	36	21	11	43	21	8	19	37	39					
Phosphorus	582	475	303	391	540	249	183	1340	681					
Zinc	183	53	35	43	49	29	-	370	313					
PCBs	*	*	*	-	-	-	-	0.62	-					

NOTE: All results in ppm

Blanks indicate parameter not analyzed

- below detection limits

* detected but not quantified (trace)

at Site G from a pit in the northeast corner. Analyses of these samples are presented in Table G-2. Elevated levels of heavy metals were found in all samples, as were various organic contaminants. PCBs were detected in sample WS-3, but not in the other two samples. Sample WS-1 showed the highest degree of organic contamination. Organics detected in this sample include dimethyl phenanthrene, phenyl indene, pyrene, trimethyl phenanthrene, and aliphatic hydrocarbons.

Data from additional samples taken adjacent to Site G in Dead Creek are addressed in the narrative for Creek Sector B. Site G may be a source of contamination in Dead Creek; however, since the hydrology in the area is not well-defined, this cannot presently be determined.

A geophysical investigation, including flux-gate magnetometry and electromagnetics (EM), was completed at Site G in December, 1985 as part of the Dead Creek RI/FS project. A survey grid with dimensions of 440 by 600 feet was laid out using a compass and tape measure. Because of the large amount of scrap metal scattered about the surface of Site G, instruments were calibrated in off-site areas. The magnetometer survey was subcontracted to Technos, Inc. of Miami, Florida.

The magnetometer survey at Site G showed that a major magnetic anomaly covers most of the northern portion of the site. Several smaller anomalies were found to the north of the large depression in the southwest corner of Site G. Survey lines run south of the fill area in a cultivated field showed no magnetic anomalies above background conditions. The mounds in the northwest corner of the site showed smaller anomalies at the surface and larger anomalies for deeper readings, indicating significant quantities of buried metals.

An EM survey was done using the same grid as for the magnetometer investigation. Shallow soundings indicated three areas showing relatively high intensity anomalies. These include a 50 feet by 20

TABLE G-2: ANALYSIS OF WASTE SAMPLES FROM OILY PIT AT SITE G
(COLLECTED BY IEPA 10-1-84)

PARAMETER ANALYZED	SAMPLE NUMBER		
	WS-1	WS-2	WS-3
Arsenic	0.3	0.6	97
Cadmium	0.1	0.8	16.8
Copper	101.4	509	712
Chromium	24.4	27.2	30
Iron	106	151	6025
Lead	26.6	52.1	337
Manganese	-	-	9.9
Mercury	0.36	0.46	1.99
Zinc	101.4	339	104,100
Aliphatic Hydrocarbons	19,200	5.23	-
Chlorobenzene	-	0.58	-
Dimethyl phenanthrene	3100	-	-
Phenyl indene	320	-	-
Pyrene	610	-	-
Trimethyl Phenanthrene	1400	-	-
PCBs	-	-	18
Other Organics (not specified)	1200	0.4	4070

NOTE: All results in ppm
- indicates below detection limits

feet area in the northeast corner, a 150 feet by 100 feet area in the east-central portion, and the entire mounded area along the west perimeter of the site. Deep soundings (approximately 10 to 15 meters in depth) indicated a significant anomaly covers most of the northern portion of the site. Three negative anomalies were recorded in the center of the fill area, possibly indicating higher, off-scale instrument readings or the presence of significant quantities non-conductive material such as concrete. The EM survey also showed anomalies trending off-site in the northwest corner, indicating the possibility that the actual filled area extends north under Queeny Avenue.

Data Assessment and Recommendations

Activities proposed at Site G for the Dead Creek Project include collecting 10 subsurface and 40 surface soil samples, and water samples from IEPA wells located on or near the site. A soil gas monitoring survey is also scheduled for Site G, and will be conducted in conjunction with ambient air monitoring at the site. Additional investigation is necessary to adequately characterize the site and to provide an adequate data base for conducting the feasibility study. Existing monitoring wells in the vicinity of the site need to be refurbished prior to sampling. Additional wells need to be installed around the site to determine if Site G is contributing to groundwater pollution in the area. Additional borings and subsurface sampling (alternatively excavation of test pits and sampling) in anomalous areas encountered during the geophysical study would be needed to provide additional information concerning depth of fill, waste characteristics, and past operation. This additional information will allow more specific evaluation of remedial alternatives. The hydrology of Site G in relation to Dead Creek also needs to be assessed to determine if the site is a source of pollution observed in the creek. This assessment would include collecting the following data: (1) Ground water elevations from a minimum of three locations on each side of the creek, (2) Surface water and creek bed elevations from three locations in the creek, and (3) Infiltration rates for the

alluvium and the Henry formation at Site G. The above data, in conjunction with the stratigraphic columns from borings in the creek bed (St. John Report), would provide sufficient information to determine the relationship, if any, between ground water and the surface hydrology of the creek.

It was previously noted that IEPA well G106 was not located during a preliminary survey. Further attempts should be made to locate this well and to repair it if it is feasible to do so. The condition of all IEPA wells should be assessed, and reconstruction or redevelopment should be performed in accordance with the assessment.

SITE H. ROGER'S CARTAGE PROPERTY

Site Description

Site H is a former disposal area covering approximately five acres in Sauget, Illinois. The site is located immediately southwest of the intersection of Queeny Avenue and Falling Springs Road. Presently, Site H is an open field which has been covered, vegetated, and graded. Several depression areas, capable of retaining rain water, are also evident. Surface drainage is generally to the west; although certain localized drainage is toward the aforementioned depressions.

Site History and Previous Investigations

A review of historical aerial photographs indicates that Site H was initially used as a disposal area sometime around 1940. Monsanto Company submitted a "Notification of Hazardous Waste Site Form" to the U.S. EPA in 1981, indicating below-ground drum disposal of organics, inorganics, and solvents. The notification listed the site name as Sauget Monsanto Illinois Landfill, and indicated that waste disposal continued until 1957. Site H is presently owned by James Tolbird of Roger's Cartage Company. Photographs suggest the site initially operated as a sand and gravel borrow pit prior to disposal activities. The southern half of Site I operated contiguously with Site H, and the properties were subsequently separated by the construction of Queeny Avenue.

Previous investigation of Site H is limited to review of historical photographs and the installation of one monitoring well downgradient from the site. This well, G110, was sampled in 1980 and 1981 as part of IEPA's hydrogeological investigation. Analytical data for well G110 is shown in Tables B-6, B-7, and B-8, presented in the Creek Sector B portion of this report. Contaminants detected in G110 include PCBs, chlorophenol, cyclohexanone, arsenic, copper, and nickel.

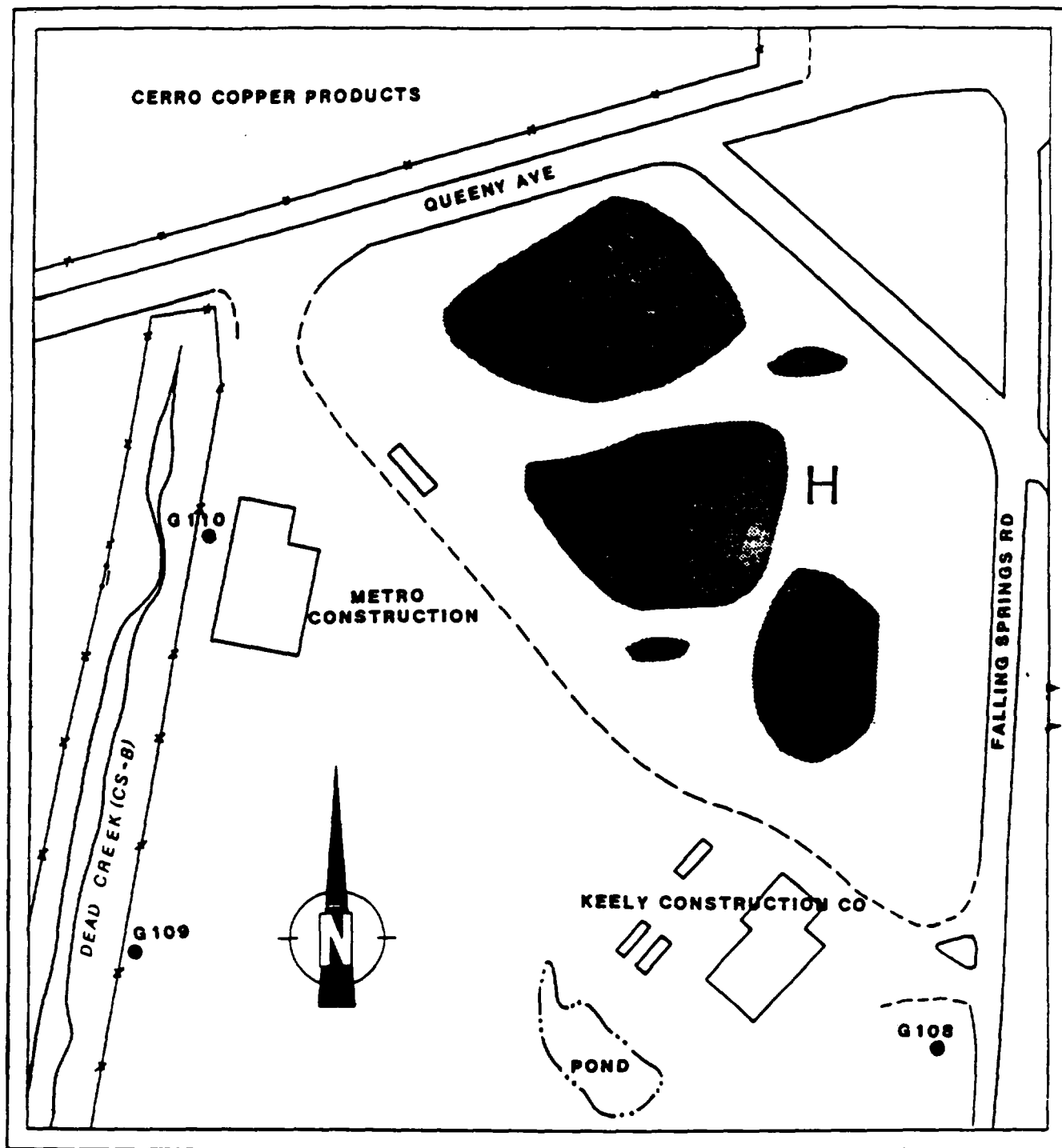
As part of the Dead Creek Project, a geophysical survey, including flux-gate magnetometry and EM, was conducted at Site H in December 1985. A survey grid with dimensions of 520 feet by 550 feet was laid out over the site using a compass and tape measure. Technos, Inc. was contracted to conduct the magnetometer survey.

The results of the magnetometer survey indicate three large areas with major magnetic anomalies and two smaller localized areas with lower intensity anomalies (Figure H-1). All anomalies are of sufficient magnitude to indicate buried drums or a large amount of other buried ferrous metal. The southernmost, large anomalous area correlated well with one of the surface depressions observed recently at the site, while the other two large areas partially correlated with depressions. This information, in conjunction with historical photographs, indicates that all anomalous areas are part of one large fill or disposal pit.

Further evaluation of Site H was done using EM with various coil spacings, allowing for different depths of penetration. Results from shallow soundings (0 to 7.5 meter effective depth range) indicate three high intensity anomalies which correlate well with the magnetic anomalies seen in the magnetometer survey. These anomalous areas were also seen in the results from intermediate soundings (5 to 15 meters). In addition, three negative anomalies were noted near the north and central portions of the site. These negative readings indicate areas of lower conductivity, and may be attributable to relatively non-conductive contaminants (organics), or to other materials such as concrete rubble or clay. Deep soundings (12 to 30 meters) showed much lower conductivity readings over the entire site, which may indicate that disposal was generally limited to a depth of less than 15 meters.

Data Assessment and Recommendations

The absence of any detailed historical information concerning waste disposal or analytical data concerning Site H creates a major data



LEGEND

G110

LOCATION OF MAGNETIC ANOMALY
IEPA MONITORING WELL

FIGURE H-1
DEAD CREEK SITE AREA H WITH MAGNETIC ANOMALIES

gap. The scope of work for this site during the Dead Creek Project includes collecting five surface and five subsurface soil samples for analysis. A soil gas survey and ambient air monitoring will also be completed at Site H. If specific contaminants are found, this data base would not be sufficient to conduct feasibility study evaluations.

Depending on the results of the initial sampling, additional sampling will be required to further define the extent of any contamination found at the site. This would include installation of monitoring wells and evaluation of ground water conditions. Further geophysical investigations to the north to Cerro Copper Products Company property would allow for more accurate definition of site boundaries and potential drum disposal areas. Additional borings and subsurface sampling or pit excavation would be necessary to accurately determine locations and types of buried wastes.

SITE I AND CREEK SECTOR A - CERRO COPPER PRODUCTS

Site Description

Site I is an operating copper refining and tube manufacturing facility covering approximately 55 acres in Sauget, Illinois. The areas of interest for the Dead Creek Project at this facility include a former sand and gravel pit which was subsequently filled with unknown wastes, and a holding pond (Creek Sector A) which formerly served as head waters for Dead Creek. The Cerro Copper Products property is bordered on the north by the Alton and Southern Railroad; on the west by Illinois Route 3; on the south by Queeny Avenue; and on the east by Falling Springs Road. The areas to be investigated encompass roughly the eastern one-third of the property. Presently, the former gravel pit/fill area is covered and graded, and is used for equipment storage.

Site History and Previous Investigations

Cerro DePasco Corporation of New York purchased the existing plant and property west of Dead Creek in 1957 from the Lewin-Mathes Corporation. Cerro Copper subsequently added property east of the creek to their holdings in 1967. Examination of historical aerial photographs indicate subsurface disposal at Site I was discontinued sometime between the years 1955-1962. These photographs also show that Site I and Site H, which is located across Queeny Avenue to the south, constitute one large subsurface disposal area. Monsanto company submitted a "Notification of Hazardous Waste Site" form for this landfill (Sauget Monsanto Illinois Landfill), indicating disposal of organics, inorganics, and solvents in drums. The years of operation listed on the notification are "unknown to 1957." Historical photographs suggest activity at the site began prior to 1937.

Creek Sector A reportedly received discharges from Monsanto and other companies prior to 1970. In the early 1970's, the culvert

under Queeny Avenue was sealed off to restrict flow from these ponds to the remainder of Dead Creek. The ponds were subsequently regraded to the north for the purpose of directing drainage into a concrete vault with a bar screen located at the north end of the Cerro Copper Products property. When the water level in the ponds rises, the water discharges through the vault to an interceptor, which ultimately drains to the Sauget Wastewater Treatment Plant. According to Cerro Copper officials, the only direct discharges to the holding ponds at this time are area run-off and roof drainage. No process wastewater, cooling water, or other wastes are directly discharged. Five runoff drain pipes project from the west bank of the ponds.

The holding ponds, Creek Sector A, on the Cerro Copper Products property were identified as a major source of groundwater pollution in the area as a result of the IEPA Preliminary Hydrogeologic Investigation completed in 1981. Analyses of water and sediment samples from the holding ponds are included in Tables IA-1 and IA-2, and sample locations are shown in Figure IA-1. Contaminants detected at significant concentrations in these samples include PCBs, dichlorobenzene, aliphatic hydrocarbons, arsenic, cadmium, chromium, lead, and mercury.

The IEPA Preliminary Hydrogeologic Investigation also included installation of one monitoring well on the Cerro Copper Products property downgradient from Site I and the holding ponds. Analyses of samples collected from this well (well number G112) are included in Tables B-6, B-7, and B-8, located in the Creek Sector B portion of this report. Contaminants detected at elevated levels in this well include chlorobenzene, dichlorobenzene, chloroaniline, phenol, copper, phosphorus, and zinc. The contaminants in the ground water may be attributable to Site I or the holding ponds (Creek Sector A); however, a more detailed investigation is necessary to accurately determine the source.

A geophysical investigation was scheduled to be conducted at Site I as part of the initial investigations for the Dead Creek Project.

TABLE IA-1: ANALYSIS OF WATER SAMPLES FROM CREEK SECTOR A
(COLLECTED BY IEPA)

PARAMETERS	SAMPLE DATE AND LOCATION			
	11/26/80		1/26/81	
	5503	5504	5501	5502
Alkalinity	127	110		
Ammonia	0.2	1.0		
Arsenic	0.058	0.025		
Barium	1.2	0.7		
BOD-5	630	158		
Boron	0.2	0.3		
Cadmium	0.36	0.19		
COD		1190		
Chloride	33	36		
Chromium (Total)	0.61	0.21		
Copper	4.5	3.6		
Cyanide	.01	.01		
Fluoride	0.4	0.7		
Hardness	227	260		
Iron	58	28		
Lead	6.6	2.8		
Magnesium	35.8	28.7		
Manganese	1.0	0.67		
Mercury	0.0016	0.0016		
Nickel	4.2	3.3		
Nitrate-Nitrite	1.4	1.7		
pH	6.9	7.0		
Phenols	0.02	0.035		
Phosphorus	1.9	3.4		
Potassium	4.3	6.2		
R.O.E.	361	407		
Selenium	0.002			
Silver	0.24	0.14		
Sodium	19.7	22.4		
Sulfate	90	130		
Zinc	30	17		
PCB (ppb)	22	28	2.0	-
Aliphatic hydrocarbons (ppb)	23,000			

NOTES: All results in ppm unless otherwise noted
Blanks indicate that parameter was not analyzed
- Indicates below detection limits

TABLE IA-2: ANALYSIS OF SEDIMENT SAMPLES FROM CREEK SECTOR A
(COLLECTED BY IEPA)

PARAMETERS	SAMPLE DATE AND LOCATION			
	11-26-80		1-28-81	
	x128	x129	x128	x129
Ammonia			30	96
Barium			1200	2500
Cadmium			51	22
Calcium			5300	13,100
Chromium			140	490
Copper			5500	24,000
Iron			29,500	51,900
Lead			840	2600
Magnesium			2300	2100
Manganese			140	250
Mercury			101	6.9
Nickel			570	1500
Potassium			670	520
Silver			29	98
Zinc			2300	5800
Aliphatic Hydrocarbons	13	26		
Dichlorobenzene	-	1.7		
PCBs	2.2	13		

NOTES: All results in ppm
Blanks indicate parameter not analyzed for
- below detection limits

IA-5

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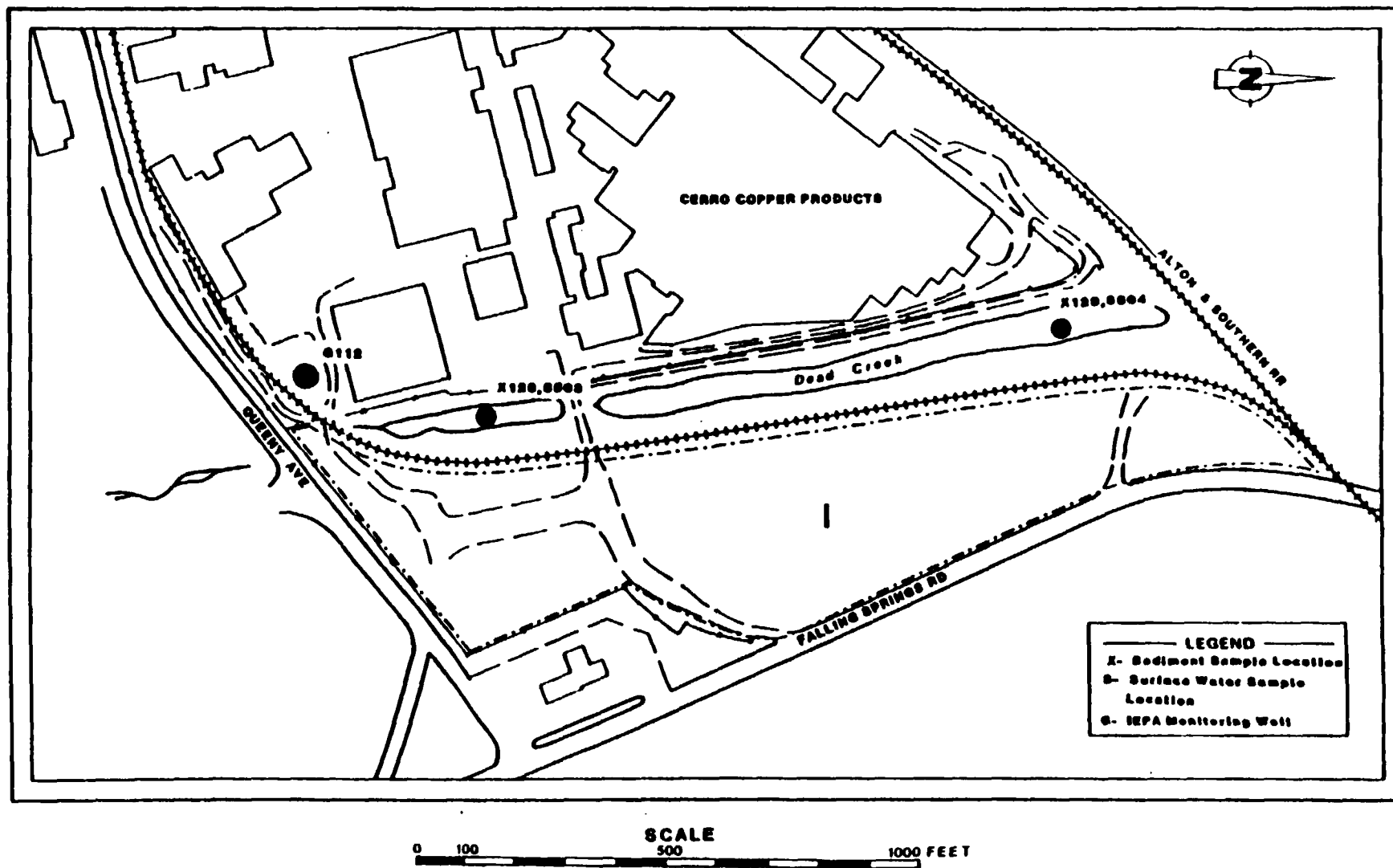


FIGURE IA-1
DEAD CREEK SITE AREA I AND CREEK SECTOR A WITH SAMPLING LOCATIONS

This investigation was cancelled on the scheduled day due to the denial of access to the site by Cerro Copper officials.

Data Assessment and Recommendations

Field activities to be completed for these sites during the project include collecting 32 surface soil and 15 subsurface soil samples at Site I, and collecting three surface water samples from Creek Sector A. A soil gas survey and ambient air monitoring are also scheduled to be conducted at Site I. In order to have an adequate data base to complete the feasibility study for these sites, additional information is necessary. Additional field activities should include a more detailed characterization of Creek Sector A, which would be accomplished with sediment sampling and assessment of subsurface soil and ground water conditions.

For Site I, the proposed geophysical investigation should be completed prior to any additional field activities. Subsequent to the geophysical investigation, 5-6 monitoring wells should be strategically located to ensure efficient collection of data necessary to identify the presence of and to determine the sources of any ground water contamination. Additional subsurface soil sampling would be conducted, as necessary, in conjunction with monitoring well installation. Excavation of test pits, in conjunction with sampling, is an alternative method of data collection for Site I.

SITE L - OLD WAGGONER COMPANY IMPOUNDMENT

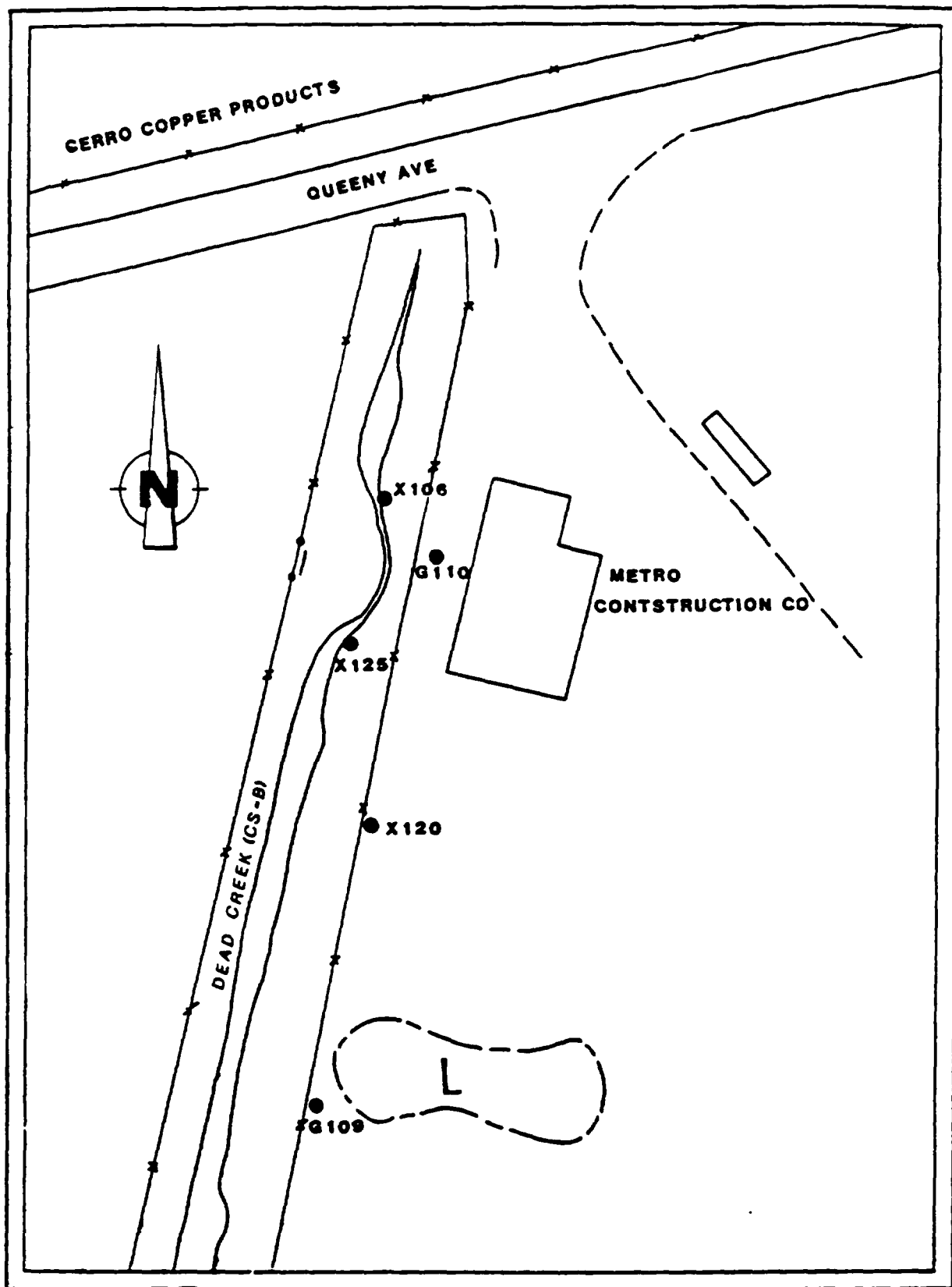
Site Description

Site L is the location of a former surface impoundment used by the Harold Waggoner Company to dispose of wash water from a truck cleaning operation. The impoundment was situated approximately 250 feet south of the present Metro Construction Company building, and approximately 125 feet east of Dead Creek (Figure L-1). The site is now covered with black cinders, and is used by Metro Construction Company for equipment storage. Several rows of heavy equipment are presently stored in the immediate area of the former impoundment. This equipment should be moved prior to any field activities.

Site History and Previous Investigations

Waggoner Company, owned and operated by Harold Waggoner, specialized in hauling industrial wastes for companies in the St. Louis/Metro East area. Harold Waggoner operated the company from 1964 to 1974, when he sold the operation to Ruan Trucking Company. Prior to 1971, Waggoner reportedly discharged wash water from truck cleaning operations directly to Dead Creek. In August 1971, the IEPA ordered Waggoner to cease discharging wastes to the creek. Subsequently, a pit was excavated for the purpose of storing wash waters, and the pit was used by Waggoner until 1974. Based on a review of historical photographs, the dimensions of this pit were determined to be roughly 70 feet by 150 feet. Ruan Trucking reportedly continued this practice of wash water storage until 1978. The property was then leased, and later purchased, by Tony Lechner of Metro Construction Company.

The IEPA calculated a rough estimate of the quantity of wash water disposed of in the impoundment between 1971 and 1978. This estimated volume, 164,000 gallons, is based on the assumption that Ruan Trucking operated at the same volume as Waggoner. The estimate is useful as a starting point for further calculations concerning



LEGEND

G110 IEPA MONITORING WELL
 X120 IEPA SOIL SAMPLING LOCATION

FIGURE L-1
DEAD CREEK SITE AREA L WITH SAMPLING LOCATIONS

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expected leachate migration rates and plume characteristics in the ground water aquifer. It should be noted that the impoundment was not lined, and the base consisted of medium to coarse grained sands.

Site L was identified in the IEPA St. John Report as a source of both ground water and surface water contamination in the area. The IEPA study included collecting several soil/sediment samples and one groundwater sample from areas downgradient of Site L. Results from analyses of sediment samples are presented in Table B-1, located in the Creek Sector B portion of this report. Results from the analyses of groundwater samples from the monitoring well downgradient of Site L (well G109) are included in Tables B-6, B-7, and B-8 (Creek Sector B).

Monitoring well G109, located approximately 100 feet west of the former impoundment, was found to be the most polluted well during IEPA's preliminary investigation. Also, during the installation of G109, drillers became nauseous from fumes at the well location. Initial sampling conducted by IEPA on October 23, 1980 indicated the presence of chlorophenol, phenol, and cyclohexanone, along with relatively high levels of heavy metals (Table B-6). Analyses from subsequent sampling events did not show organic contaminants, other than phenol. Arsenic, cadmium, copper, nickel, and phosphorus were detected at quantities significantly above IEPA's water quality standards. Other IEPA monitoring wells adjacent to the creek showed concentrations of these contaminants at least an order of magnitude (10 times) less than those found in G109. No other likely sources of contamination are known to exist in the immediate area. In view of these points, it is likely that contaminants found in well G109 are attributable to the former disposal impoundment (Site L).

Surface soil samples collected in the vicinity of Site L during the IEPA study include X106, X120, and X125 (Figure L-1). Samples X106 and X125 were taken from the creek bed, and X120 was taken from surface soil east of the creek in the general vicinity of the

impoundment. Analyses of these samples are presented in Table B-1, which is located in the Creek Sector B portion of this report. High levels of several organic contaminants were detected in X125. These include alkyl benzenes, dichlorobenzene, dichlorophenol, hydrocarbons, naphthalenes, and trichlorobenzene at concentrations ranging from 78 to 21,000 parts per million (ppm). PCBs, including 10,000 ppm at X125, were detected in all three samples. Sample X106 was not analyzed for inorganic parameters, and concentrations of inorganics in X120 and X125 were only slightly higher than those found in the background soil sample X121 (see Tables B-1 and B-3).

Geophysical surveys were completed at Site L as part of the Dead Creek Project in December, 1985. These surveys included the use of EM and flux-gate magnetometry over a 200 feet by 200 feet grid in the area of the former disposal impoundment. Two rows of heavy equipment and trailers were present in the middle of the site at the time of the survey.

Magnetometer readings indicated a significant magnetic anomaly in the southwest corner of the site. Another large anomaly was observed between the rows of equipment; but an accurate assessment of the size and actual magnitude of the anomaly was not possible due to surface interference. An EM survey was conducted using different coil alignments to obtain readings from various depths. Shallow soundings indicated a single anomaly with the approximate dimensions of 150 feet by 100 feet in the southeast corner of Site L. Readings in this area were significantly higher than those obtained from a random check point in the cultivated field to the south. Deeper instrument penetration showed an anomaly that was similarly located in the southeast corner; however, the size and the magnitude of the readings were smaller than observed in the shallow investigation. Readings from the remainder of Site L showed no significant anomalies, although these readings were generally higher than those seen at the check point in the cultivated field. This is probably due to cinders covering the site, which are not present in the cultivated field.

Data Assessment and Recommendations

Investigations planned for Site L during the RI include subsurface soil sampling and soil gas monitoring. Ambient air monitoring will also be conducted as for all sites in the project.

Further activities necessary to provide adequate data for the feasibility study should include installation and sampling of 3 to 4 monitoring wells, and collecting additional subsurface soil samples. Subsurface soil sampling would be done in conjunction with well installation, and would provide additional data concerning migration of contaminants. The hydrology of the area also needs to be assessed to determine the interaction, if any, between the ground water and the creek.

Preliminary geophysical investigations and subsequent acquisition of historical aerial photographs indicate the likely presence of waste residues extending to the farmland to the south of Site L. Accordingly, additional surveys should be conducted south of the area initially surveyed. Additional geophysical investigations would allow better definition of the impoundment boundaries and also aid in delineating off-site migration of contaminants.

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SITE N - H.H. HALL CONSTRUCTION CO.

Site Description

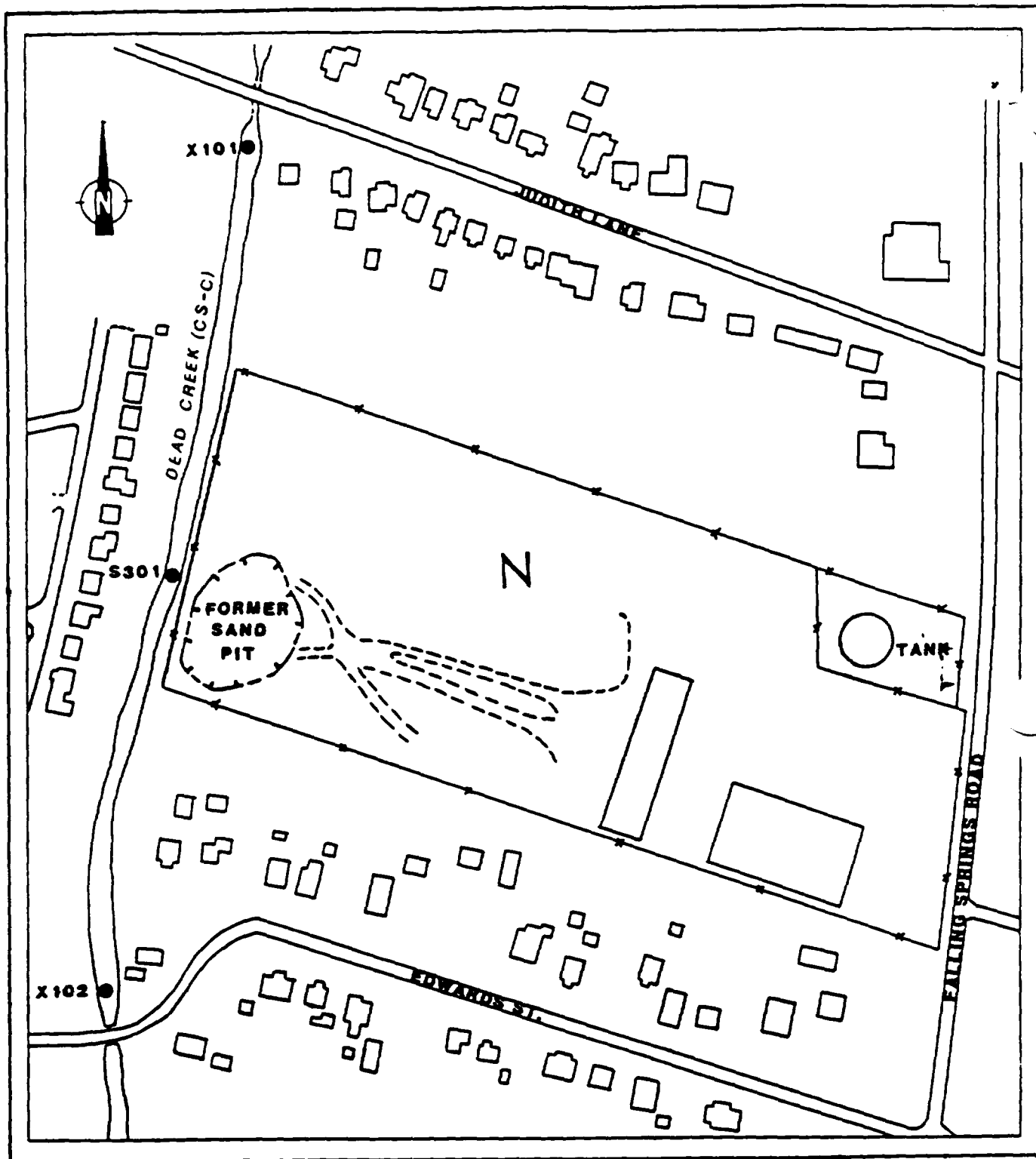
Site N is an operations and equipment storage facility for the H. H. Hall Construction Company of East St. Louis. The site is located in a residential/commercial neighborhood in the town of Cahokia, Illinois. Site N is bordered on the north by residential property along Judith Lane; on the west by Dead Creek; on the south by residential property along Edwards Street, and on the east by Falling Springs Road. The entire facility covers approximately 23 acres. Access to the site is restricted by a chain link fence.

Site History and Previous Investigation

Historical photographs indicate that a borrow pit existed at the facility which may have been used for waste disposal. The borrow pit, located in the southwest corner adjacent to Dead Creek, is roughly 4-5 acres in size (Figure N-1). No file information has been located concerning waste disposal at Site N. The pit has been filled and covered.

Historical photographs indicate that excavation at Site N began sometime prior to 1950. The presence of water in the pit was displayed in photographs from 1950, suggesting excavation into the Henry Formation aquifer. Hall Construction Company officials were recently contacted in an attempt to gather further information about the site. Apparently the pit was excavated in the late 1940's as a borrow pit for road construction materials. According to the officials contacted, concrete rubble and other demolition debris are the only wastes disposed of in the pit by Hall Construction. The area is presently covered with rubble and debris and is used only for equipment storage.

Although no analytical data has been developed for Site N, it should not be overlooked as a possible source of contamination in the area.



SCALE



LEGEND

X101 IEPA SEDIMENT SAMPLING LOCATION

S301 IEPA SURFACE WATER SAMPLING LOCATION

FIGURE N-1

DEAD CREEK SITE AREA N WITH SAMPLING LOCATIONS IN CREEK SECTOR C

N-2

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The site is located adjacent to Creek Sector C of Dead Creek, which has shown elevated levels of several contaminants, including PCBs. At this time, it cannot be determined if the contamination in Creek Sector C is the result of flow from the heavily-contaminated Creek Sector B, or the result of other unknown sources. It is also not known if access to Site N has always been restricted. Accordingly, the possibility exists that other parties may have used the pit for disposal.

Data Assessment and Recommendations

No sampling or field investigation data is presently available for Site N. Field activities scheduled at Site N during the Dead Creek Project include collecting three surface and two subsurface soil samples. In addition, a soil gas survey and ambient air monitoring will be conducted at the site. These investigations should be adequate to characterize the types of wastes present. The results of this sampling should also indicate if further investigation of the site is warranted.

If contamination is identified at the site, additional subsurface soil sampling and installation and sampling of groundwater monitoring wells should be carried out. This added investigation would be essential to complete feasibility study activities. In addition, depending upon subsurface conditions identified, a geophysical investigation may be of value to delineate pit boundaries and determine the presence of subsurface drum disposal. The hydrology of the creek in relation to the site should also be assessed to determine the potential for discharge from the pit to the creek.

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SITE M. HALL CONSTRUCTION PIT

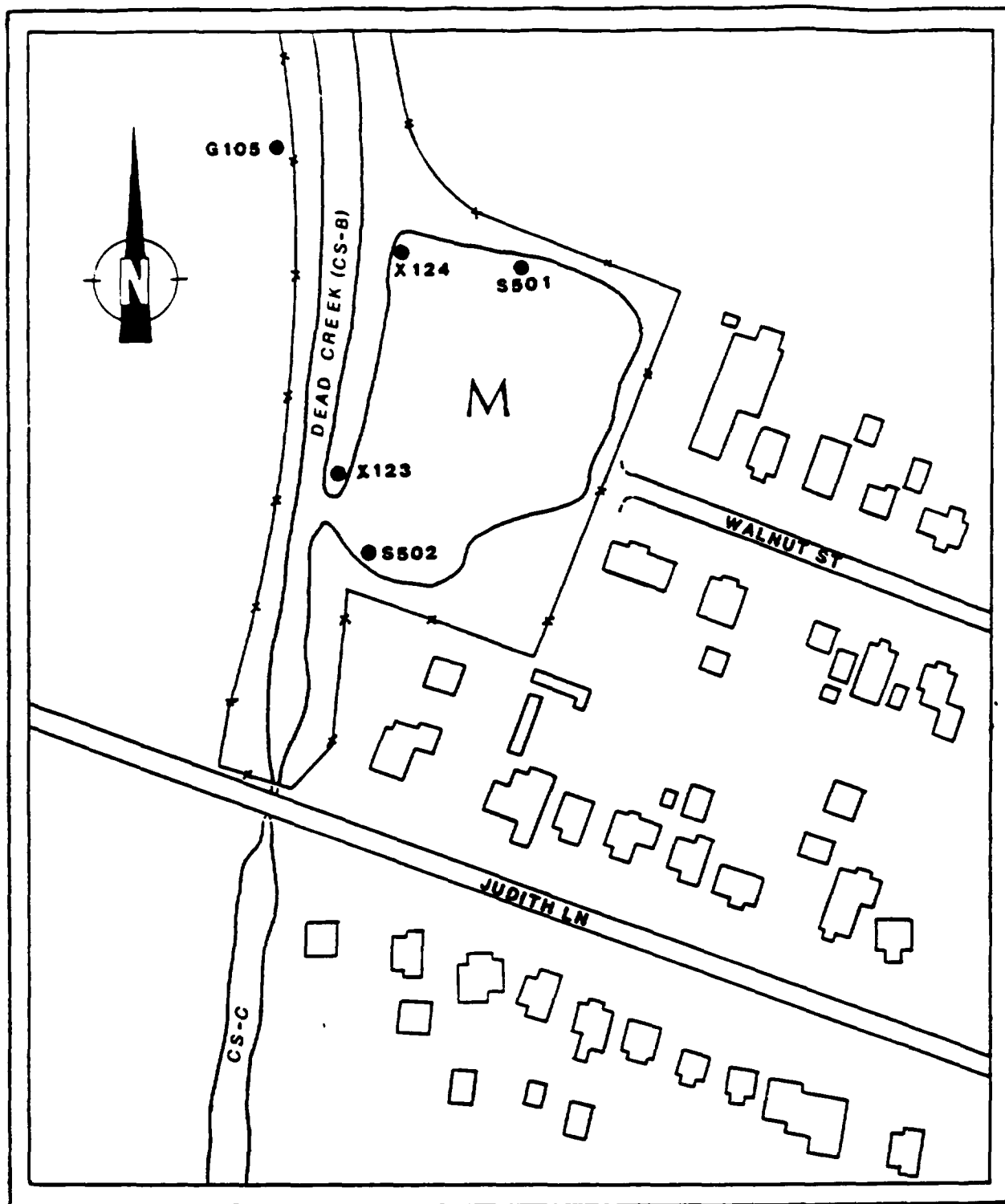
Site Description

Site M is a sand pit excavated by the H.H. Hall Construction Company in the mid to late 1940's. The pit is located immediately east of Dead Creek, and approximately 300 feet north of Judith Lane in Cahokia, Illinois (Figure M-1). The dimensions of the pit are approximately 275 by 350 feet. Presently, Site M is enclosed by a chain link fence, which also surrounds Creek Sector B. A small residential area is located just east of the pit on Walnut Street, which earlier served as an access road to Site M. The pit was excavated prior to any residential development on this street. Observations suggest that the pit is apparently isolated from Dead Creek by an embankment; however, this embankment may not be continuous. Aerial photographs indicate that a small break in the southern part of the embankment may allow flow between the creek and Site M. This possibility is supported by past IEPA inspections indicating discoloration in the pit similar to that observed in Dead Creek.

Site History and Previous Investigations

No information is available on file concerning waste disposal activities at Site M. It is possible that disposal did occur, since access to the pit remained unrestricted until a snow fence was erected in 1980. From review of historical aerial photographs, it is evident that minor changes in the dimensions of the pit have occurred. This could be an indication of filling around the perimeter of the pit. IEPA and the Cahokia Health Department have received numerous complaints about Site M and the creek from residents in the area. These complaints address, for the most part, seepage of odoriferous water into basements and problems associated with well water used to water gardens and lawns.

IEPA sampled several private wells in the area during the preliminary



LEGEND

- G105 IEPA MONITORING WELL
- X124 IEPA SEDIMENT SAMPLING LOCATION
- S502 IEPA SURFACE WATER SAMPLING LOCATION

FIGURE M-1
DEAD CREEK SITE AREA M WITH SAMPLING LOCATIONS

hydrogeological study conducted in 1980. In addition, one sample of basement seepage from a home on Walnut Street near Site M was collected. Analytical results of these samples are presented in Table B-9, located in the Creek Sector B portion of the report. The results show concentrations of copper, manganese, and phosphorus above the state's water quality standards in one or more wells as well as in the basement seepage sample.

In conjunction with the creek sampling done in 1980, IEPA collected sediment and water samples from Site M. Analytical data for these samples are presented in Table M-1. In general, the water samples showed no significant contamination, although water quality standards for copper, phosphorous, and zinc were exceeded. Trace levels of PCBs (0.9 to 4.4 ppb) were found in both samples. The sediment samples, however, did show fairly high levels of several contaminants, including cadmium, chromium, copper, lead, nickel, zinc, and PCBs. In general, the samples closer to the break in the embankment separating Site M from Dead Creek showed higher levels of contaminants than the other samples.

Because water levels in the pit were approximately two feet higher than those found in the closest monitoring wells, the IEPA study concluded that there is no hydrological connection between water in the pit and the ground water aquifer. This assessment may or may not be accurate.

Data Assessments and Recommendations

The IEPA study conducted in 1980 showed significant contamination at Site M and identified specific waste types present. Investigation of Site M for the Dead Creek Project includes collecting two surface water and three sediment samples. A soil gas survey and ambient air monitoring will also be conducted at Site M. This sampling program will not provide sufficient data to adequately evaluate remedial alternatives. Core samples should be collected from the bottom of the pit in order to determine the types of wastes present and the

TABLE M-1:
ANALYSIS OF SURFACE WATER AND SEDIMENT SAMPLES FROM SITE M
(COLLECTED BY IEPA 9-15-80)

PARAMETERS	SAMPLE LOCATIONS			
	<u>Water</u>		<u>Sediment</u>	
	S 501	S 502	X 123	X 124
Alkalinity	80	85		
Arsenic	0.006	0.01		
Barium	0.2	0.5	4,400	350
Beryllium			3	1
BOD-5	4	33		
Boron	0.2	0.2	-	25
Cadmium	-	-	40	4
Calcium			12,500	4,500
COD	58	85		
Chloride	27	28		
Chromium	-	-	150	50
Copper	0.035	0.33	18,700	4,500
Cyanide	0.02	-		
Flouride	0.4	0.4		
Iron	0.8	1.8	49,000	13,500
Lead	-	0.01	1,400	130
Magnesium	6	6	3,400	3,500
Manganese	0.06	0.82	200	80
Mercury	-	-		
Nickel	0.02	0.05	1,600	590
Phenol	0.01	0.01		
Phosphorus	0.17	0.31		
Potassium	5.9	6.2	950	1,000
Silver	-	-	30	6
Sodium	24	25	650	100
Strontium			175	27
Vanadium			42	19
Zinc	0.1	0.7	17,700	2,600
PCBs	0.0009	0.0044	1,100	24
Dichlorobenzene				

NOTE: All results in ppm.
Blanks indicate parameter not analyzed.
- Indicates below detection limits.

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extent of vertical migration of contaminants that has occurred. In addition, several borings should be completed around the perimeter of the pit, including the embankment between the pit and the creek. It would also be necessary to verify that there is no hydrological connection between the water in the pit and the ground water aquifer. This would be best accomplished using continuous recording gauging stations at wells in the vicinity of the creek and at the pit. These activities would provide the information necessary to proceed with a viable remedial program.

CREEK SECTOR B - DEAD CREEK

Site Description

Creek Sector B (CS-B) includes the portion of Dead Creek lying between Queeny Avenue and Judith Lane in Sauget, Illinois. Three other sites in the Dead Creek Project are located adjacent to CS-B. These include Site G to the northwest, Site L to the northeast, and Site M to the southeast. All of these sites have been identified at one time or another as possible sources of pollution in CS-B. Presently, CS-B and Site M are enclosed by a chain link fence which was installed by the USEPA in 1982. The banks of the creek are heavily vegetated, and debris is scattered throughout the northern one-half of CS-B. Culverts at Queeny Avenue and Judith Lane have been blocked in order to prevent any release of contaminants to the remainder of the creek, although the adequacy of these blocks has been questioned several times. Water levels in the creek vary substantially depending on rainfall, and during extended periods of no precipitation, the creek becomes a dry ditch.

Site History and Previous Investigations

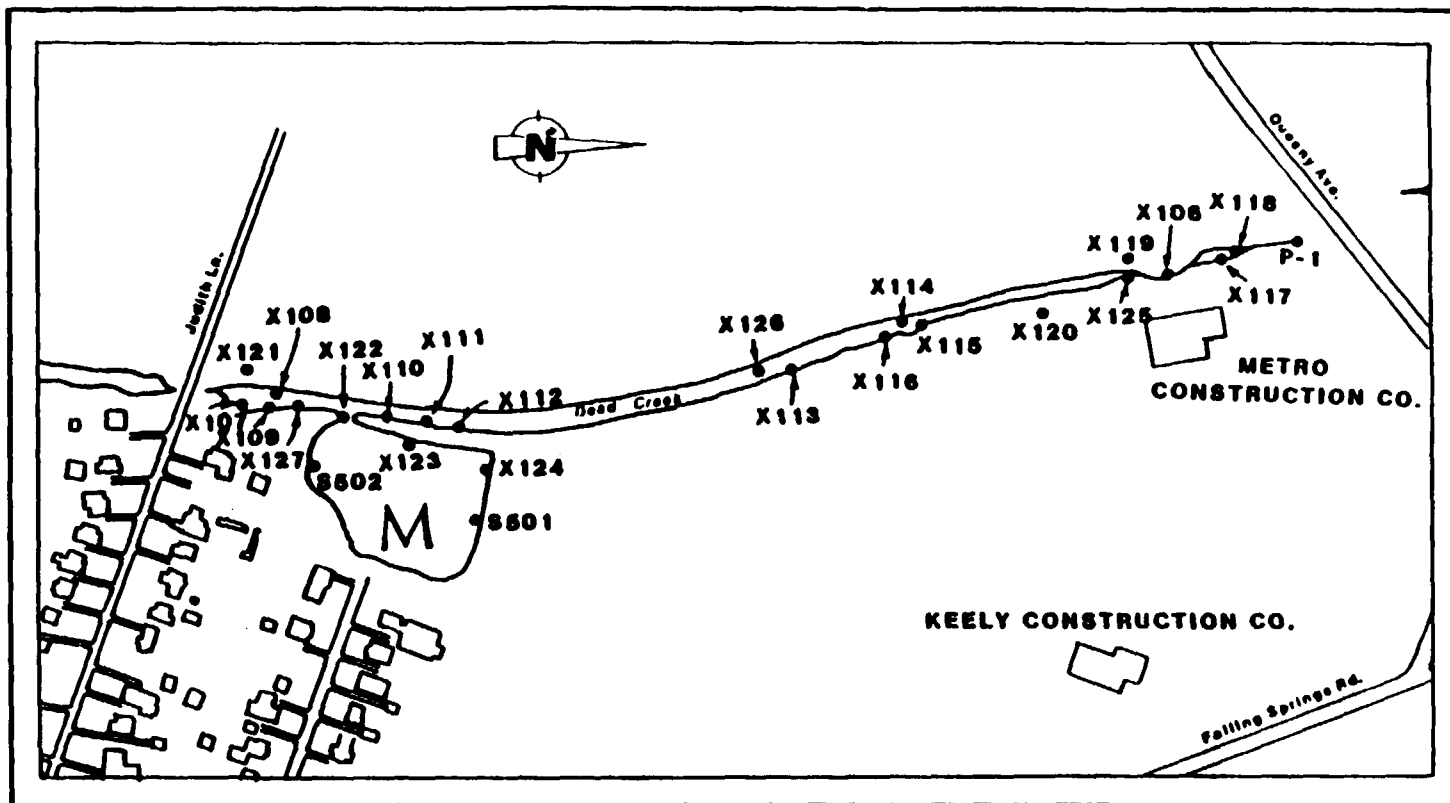
The IEPA initially became aware of environmental problems at CS-B in May, 1980 when several complaints were received concerning smouldering and fires observed the creek bed. In August, 1980, a local resident's dog died, apparently of chemical burns resulting from contact with materials in the ditch. Following this incident, the IEPA conducted preliminary sampling to determine the cause of these problems in CS-B. Chemical analysis of these samples indicated high levels of PCBs, phosphorus, and heavy metals, and the IEPA subsequently authorized the installation of fencing in order to prevent public access to the creek. In September 1980, the Illinois Department of Transportation (IDOT) completed installation of 7000 feet of snow fence with warning signs around CS-B and Site M. The IEPA subsequently performed a preliminary hydrogeological investigation in the area in an attempt to identify the sources of pollution

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in Dead Creek. The results of this investigation are documented in the St. John Report. The snow fence was later replaced with a chain link and barbed wire fence. The installation of this fence was authorized by the USEPA, and was completed in October, 1982.

Prior to the IEPA investigation in 1980, the City of Cahokia Health Department received complaints from area residents concerning discharges from Cerro Copper Product (Cerro) entering CS-B. In 1975, IEPA visited the site in order to determine if these discharges were occurring. Investigators observed discoloration in the creek and along the banks similar to what was later observed in the holding ponds at Cerro. One water sample was collected by IEPA from the creek immediately south of Queeny Avenue. Analysis of this sample indicated the presence of copper (0.3 ppm), iron (3.2 ppm), and mercury (0.1 ppb). The culvert under Queeny Avenue was sealed sometime in the early 1970's by Cerro Copper and the Monsanto Chemical Company for the purpose of restricting flow from the holding ponds at Cerro (Creek Sector A). The holding ponds were also regraded to the north to direct their flow to an interceptor discharging to the Sauget Wastewater Treatment Plant. The investigators concluded that flow through the blocked culvert had occurred, although the direction of flow could not be determined because no flow was evident at the time of the inspection.

The IEPA hydrogeological study, conducted in 1980, included collecting 20 surface sediment samples for analysis from CS-B (Figure B-1). Analyses of samples from the northern portion of CS-B are presented in Table B-1. Samples x106, x119, x120, x125, and x126 showed PCBs in concentrations ranging from 1.1 to 10,000 parts per million (ppm). Sample x125, taken adjacent to the former Waggoner Company operation, contained additional organic contaminants, including alkylbenzenes (370 ppm), dichlorobenzene (660 ppm), trichlorobenzene (78 ppm), dichlorophenol (170 ppm), and hydrocarbons (21,000 ppm). These contaminants were not detected in other surface sediment samples in the northern portion of CS-B during this



LEGEND

- X106 SEDIMENT SAMPLING LOCATION
- S502 SURFACE WATER SAMPLING LOCATION
- P-1 SUBSURFACE SOIL SAMPLING LOCATION



FIGURE B-1
I EPA SAMPLING LOCATIONS AT CREEK SECTOR B AND SITE M

TABLE B-1: ANALYSIS OF SOIL SAMPLES IN THE
NORTHERN PORTION OF CREEK SECTOR B
(COLLECTED BY IEPA 9-8-80 THROUGH 10-25-80)

PARAMETERS	SAMPLE LOCATIONS										
	x106	x113	x114	x115	x116	x117	x118	x119	x120	x125	x126
Aluminum		10,000	6,400	9,000	9,000	1,300	1,200				
Arsenic		300	23	18	9	16	15				
Barium		2,400	1,600	3,400	300	400	1,600	510	1,200	2,500	5,000
Beryllium		-	-	-	-	-	-	1	1	-	2
Boron		-	-	-	-	-	6	-	-	-	76
Cadmium		400	-	120	-	-	-	7	3	6	70
Calcium		11,000	14,000	11,000	5,000	1,600	6,000	7,300	72,000	6,900	19,000
Chromium		250	400	120	130	-	-	36	38	50	100
Cobalt		100	-	40	-	-	-	9	10	9	50
Copper		3,800	4,800	22,000	270	160	1,000	100	150	1,000	44,800
Iron		365,000	55,000	40,000	12,000	2,400	4,300	17,500	16,200	7,000	107,000
Lead		3,600	2,000	3,200	80	-	100	43	60	260	2,000
Magnesium		4,000	2,800	5,000	2,600	1,200	1,000	4,500	4,300	380	3,700
Manganese		120	130	150	60	40	50	260	350	45	280
Mercury		30	1.7	4	0.2	2	2	-	-	-	-
Nickel		2,500	1,700	2,400	140	-	-	-	80	130	3,000
Phosphorus		-	-	-	-	-	-	-	-	2,000	8,900
Potassium		1,400	1,300	1,500	2,300	850	1,200	1,800	1,200	770	860
Silver		-	-	-	-	50	-	-	-	-	100
Sodium		2,800	700	1,100	360	150	180	110	225	80	1,400
Strontium		180	140	200	40	-	-	42	140	50	300
Vanadium		-	-	150	-	-	-	27	27	13	85
Zinc		61,000	20,000	71,000	2,500	-	300	2,000	700	1,500	62,000
PCBs	5,200							1.1	80	10,000	350
Alkylbenzenes	-							-	-	370	-
Dichlorobenzene	-							-	-	660	-
Dichlorophenol	-							-	-	170	-
Hydrocarbons	-							-	-	21,000	-
Naphthalenes	-							-	-	650	-
Trichlorobenzene	-							-	-	78	-

NOTE: All results in ppm
Blank indicate parameter not analyzed
- Indicates below detection limits

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investigation. In general, inorganic analysis of these samples indicated high levels of several metals in comparison with background conditions (Table B-3, sample x121).

Subsurface soil samples were also collected by IEPA from one location in the northern portion of CS-B during the 1980 investigation. Analyses of samples from boring P-1 are included in Table B-2. Results indicated the presence of PCBs to a depth of seven feet, and other organic contaminants to a depth of three feet. PCB concentrations ranged from 9,200 ppm near the surface to 53 ppm at depths greater than 4 feet and up to 7 feet. Other organic contaminants were detected at concentrations ranging from 12,000 ppm near the surface to 240 ppm at 2.5 feet. These results indicate non-uniform contaminant deposition in the northern portion of CS-B, which is common in riverine systems. The above data indicate that historical release(s) of contaminants to the northern portion of CS-B did occur. However, the horizontal and vertical extent of the resulting contamination has not been fully defined.

Analyses of sediment samples from the southern portion of CS-B are summarized in Table B-3. Sample x121 was taken from soil outside the creek bed to establish background conditions. Samples x107, x122, and x127 contained PCBs at concentrations ranging from 73 to 540 ppm. Sample x122 also showed diclorobenzene (0.35 ppm). This was the only organic contaminant other than PCBs detected in samples from the southern portion of CS-B. Several metals, including arsenic, cadmium, chromium, copper, lead, and zinc, were detected at levels significantly above background concentrations in all samples. However, the metal concentrations were comparable to concentrations detected in samples of sediment taken in the northern portion of CS-B. All of the samples were collected from the creek bed adjacent to, or downstream from Site M, which is an old sand pit excavated by the H.H. Hall Construction Company in approximately 1950. Hazardous materials were not reported to have been disposed of at Site M.

In October, 1980 IEPA and Monsanto Chemical Company cooperatively

TABLE B-2: ANALYSIS OF SUBSURFACE SOIL
 SAMPLES AT BORING LOCATION P-1
 IN CREEK SECTOR B. (COLLECTED BY
 IEPA 9-8-80)

PARAMETERS	SAMPLE DEPTH						
	0'-1'	1'-2'	2'-3'	3'-4'	4'-5'	5'-6'	6'-7'
Biphenyl	6,000	9,000	1,100				
Chloronitrobenzene	200	240					
Dichlorobenzene	12,000	8,900	240				
PCBs	9,200	2,600	928-6	240	53	53	54
Trichlorobenzene	380	3,700	590				
Xylene	540	250					

NOTE: All results in ppm
 Blanks indicate below detection limits

TABLE B-3: ANALYSIS OF SOIL SAMPLES IN THE
SOUTHERN PORTION OF CREEK SECTOR B
(COLLECTED BY IEPA 9-8-80 THROUGH 10-25-80)

PARAMETERS	SAMPLE LOCATIONS								
	x107	x108	x109	x110	x111	x112	x121	x122	x127
Aluminum		8,000	9,100	7,000	8,000	6,600			
Arsenic	6,000	44	25	67	80	50			
Barium	4,800	3,800	1,600	4,300	1,800	8,000	230	5,500	2,500
Beryllium	-	-	-	-	-	-	-	2	2
Boron	-	-	-	-	-	-	-	-	-
Cadmium	70	-	200	40	100	100	1	35	50
Calcium	11,000	10,000	24,000	16,000	13,000	30,000	11,000	15,000	8,000
Chromium	360	300	-	140	50	50	-	50	340
Cobalt	30	30	20	-	-	30	9	15	30
Copper	32,000	31,000	7,700	22,000	15,000	41,000	100	21,900	28,000
Iron	70,000	58,000	75,000	67,000	68,000	52,000	16,500	50,000	63,000
Lead	24,000	2,000	1,700	2,000	2,000	5,100	-	1,700	1,700
Magnesium	2,900	3,900	3,600	4,100	4,000	4,000	5,900	3,800	2,700
Manganese	150	150	300	200	160	300	370	190	150
Mercury	-	1.7	3	3.3	3.2	6	-	-	-
Nickel	3,500	3,000	900	1,900	2,000	2,700	120	1,700	
Phosphorus	7,040	-	-	-	-	-	-	-	4,700
Potassium	1,200	1,500	1,700	1,300	1,600	1,200	1,500	960	1,000
Silver	40	-	-	-	-	-	-	30	40
Sodium	1,700	900	900	700	1,000	1,600	80	630	700
Strontium	180	200	130	160	160	430	32	190	130
Vanadium	60	-	-	70	100	-	25	45	45
Zinc	25,000	22,000	27,000	25,000	47,000	52,000	230	19,900	28,000
PCBs	120	-	-	-	-	-	-	540	73
Dichlorobenzene	-	-	-	-	-	-	-	0.35	-

NOTE: All results in ppm
Blanks indicate that parameter not analyzed
- Indicates parameter is below detector limit

collected three sediment samples from CS-B in order to confirm results of earlier sampling done by IEPA. SD-1 was collected from the creek bed 40 yards-south of Queeny Avenue. This location is adjacent to the former Waggoner Company building and also near an old outfall (effluent pipe) from the Midwest Rubber Company. Samples SD-2 and SD-3 were collected approximately 220 yards south of SD-1, in the central portion of CS-B. Results of these samples, including a blank soil sample collected from the Missouri Bottoms in St. Charles, Mo., are presented in Tables B-4 and B-5. PCBs (45-13,000 ppm) were found in all three samples from CS-B, as were several chlorinated benzenes. Chlorinated phenols and phosphate ester were detected in samples SD-1 and SD-3, but were not found in SD-2. The analysis of these samples for inorganic parameters detected generally higher levels of inorganic parameters in SD-2 and SD-3 than those for SD-1 and the soil blank. These results clearly indicate differential contamination in CS-B, with SD-1 showing high levels of PCBs and other organic compounds, whereas SD-2 and SD-3 contained higher levels of metals.

IEPA personnel also collected two sediment samples from CS-B in December, 1982, as part of an area-wide dioxin sampling effort managed by the USEPA which also included Site O. The first sample was collected along the east bank of the creek, approximately 80 yards south of Queeny Avenue. Previous sampling conducted by IEPA in this area had shown high concentrations of PCBs. The second sample was collected along the west bank of the creek, approximately 50 yards south of Queeny Avenue. Both samples were analyzed specifically for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) by a USEPA contract laboratory. The first sample showed a quantified level (0.54 ppb) of TCDD, and the second sample was below the detection limit.

IEPAs Preliminary Hydrogeological Investigation of Dead Creek in 1980 was conducted for the purpose of determining possible sources of pollution observed in CS-B. The study included installation and

TABLE B-4: ORGANIC ANALYSIS OF SEDIMENT
 SAMPLES FROM DEAD CREEK, SECTOR B
 (SPLIT SAMPLES-IEPA AND MONSANTO
 COLLECTED 10-2-80)

PARAMETERS	SAMPLE LOCATIONS			
	SD-1	SD-2	SD-3	Blank*
CHLOROBENZENES:				
Monochlorobenzene	(0.9)		(0.3)	
p-Dichlorobenzene	370	(0.3)	(0.4)	
o-Dichlorobenzene	80	(0.6)	1	
Trichlorobenzenes	85	1.6	(0.7)	
Tetrachlorobenzenes	6.1	2.4	(0.4)	
Pentachlorobenzene		1.2		
Hexachlorobenzene				
Nitrochlorobenzenes	120			
CHLOROPHENOLS:				
o-Chlorophenol	3.7			
p-Chlorophenol	6.6		(0.9)	
2,4-Dichlorophenol	1.2			
Pentachlorophenol	130		1.8	
PHOSPHATE ESTERS:				
Dibutylphenyl Phosphate	330		(0.8)	
Butyldiphenyl Phosphate			(0.8)	
Triphenyl Phosphate	2600			
2-Ethylhexyldiphenyl Phosphate			2.2	
Isodecyldiphenyl Phosphate				
T-Butylphenyldiphenyl Phosphate	28			
Di-t-butylphenyldiphenyl Phosphate				
Nonylphenyl Diphenyl Phosphate				
Cumylphenyldiphenyl Phosphate	3.7			
PCBs (C ₁₂ to C ₁₆ Homologs)	13,000	240	45	

NOTE: All values in ppm

*Soil blank collected from Missouri Bottoms, St. Charles, Mo.

Blanks indicate below detection limits

() Semi-quantitative values

TABLE B-5: INORGANIC ANALYSIS OF SEDIMENT SAMPLES
FROM DEAD CREEK, SECTOR B
(SPLIT SAMPLES - IEPA AND MONSANTO
COLLECTED 10-2-80)

PARAMETERS	SAMPLE LOCATIONS			
	SD-1	SD-2	SD-3	Blank*
Aluminum	1,400	5,100	5,300	5,600
Antimony	13	240	160	29
Arsenic	210	40	55	5
Barium	770	1,200	1,300	130
Beryllium	-	-	-	-
Boron	28	160	100	27
Cadmium	5.1	60	55	3.9
Calcium	8,500	9,200	6,200	4,600
Chromium	25	110	240	19
Cobalt	15	180	120	33
Copper	460	28,000	18,000	19
Iron	4,700	53,000	30,000	9,900
Lead	180	2,000	1,600	50
Magnesium	460	2,200	2,000	2,300
Manganese	29	170	110	510
Molybdenum	6.1	92	68	11
Nickel	110	2,000	1,700	39
Phosphorus	2,500	13,000	9,400	610
Silicon	73	150	89	110
Silver	-	42	29	-
Sodium	400	540	410	320
Strontium	35	230	110	17
Tin	18	260	320	18
Titanium	32	110	80	37
Vanadium	34	140	130	130
Zinc	280	32,000	18,000	56

NOTE: All values in ppm

* Soil blank collected from Missouri Bottoms, St. Charles, MO.
- Indicates below detection limits.

sampling of 12 monitoring wells in addition to the 1980 soil/sediment sampling described above. Residential wells were also sampled to determine ground water quality in the area. Locations of IEPA monitoring wells and residential well samples are shown in Figure B-2. All IEPA wells were screened in the Henry Formation sands, with screened interval elevations ranging between 366 and 402 feet Mean Sea Level. The hydraulic gradient in the vicinity of CS-B is very flat, with ground water flow generally to the west toward the Mississippi River.

Analytical data for three sets of samples from the IEPA monitoring wells, corresponding to three sampling events in 1980 and 1981, are presented in Tables B-6, B-7, and B-8. Well G108 can be considered a background well due to its location upgradient from the known disposal areas around CS-B. Organic contaminants were consistently found in Wells G107 and G112. These wells are in downgradient monitoring positions for sites G and I respectively. Certain organic contaminants were detected in Wells G102, G109 and G110 during the initial sample event, but these wells did not show any of the organics in subsequent samples. Well G102 is located immediately west of the northern portion of CS-B, and near the southeast corner of Site G. Well G109 is located approximately 150 feet west of the former Waggoner surface impoundment (Site L). Well G110 is located downgradient of Site H. PCBs were detected at one time or another in Wells G101, G102, G104, G106, G107, G110, and G112. Of these, only G101 and G102 showed PCBs in all three sets of samples.

Inorganic analyses of samples from the IEPA monitoring wells indicate several parameters at concentrations above background (G108) and water quality standards. Standards for iron, manganese, and phosphorus were exceeded in samples from the background well. Barium, cadmium and lead were detected at concentrations exceeding standards in one or more well(s). In general, wells G109, G110, and G112 showed the most significant inorganic contamination. When compared with data for other wells, G109 contained very high concentrations of arsenic, copper, nickel, and zinc. The pH for G109

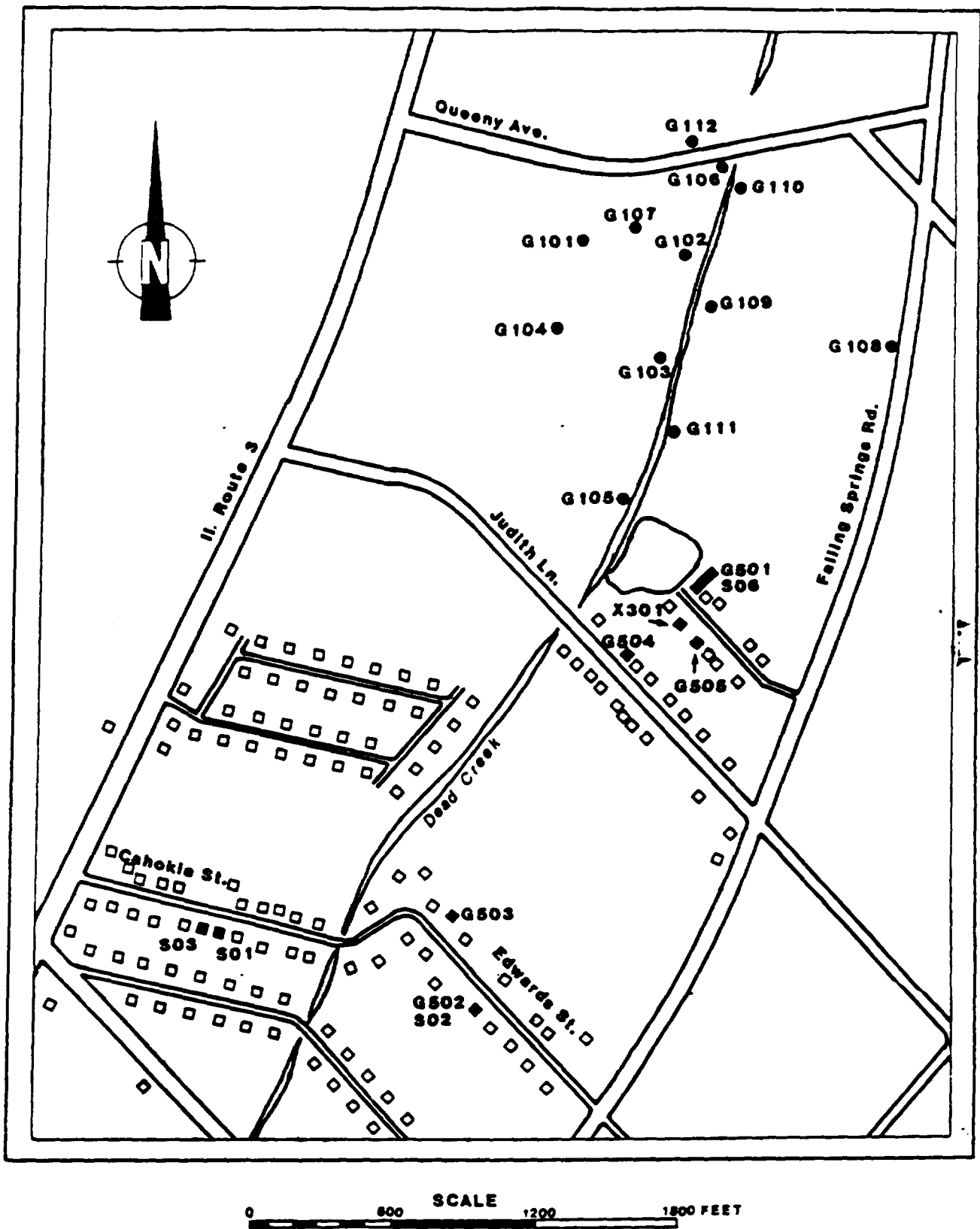


FIGURE B-2
LOCATIONS OF IEPA MONITORING WELLS AND RESIDENTIAL
WELLS SAMPLED IN THE VICINITY OF DEAD CREEK

TABLE B-6: ANALYSIS OF GROUNDWATER SAMPLES FROM THE IEPA MONITORING WELLS
(COLLECTED 10-23-80)

PARAMETERS	SAMPLE LOCATIONS											
	G101	G102	G103	G104	G105	G106	G107	G108	G109	G110	G111	G112
Alkalinity	362	410	336	406	271	387	552	375	287	210	302	599
Ammonia	0.3	1.0	1.7	0.4	0.9	2.9	0.5	0.3	4.5	1.2	0.1	1.5
Arsenic	0.023	0.023	0.043	0.049	0.067	0.16	0.043	0.008	0.055	0.053	0.008	0.019
Barium	1.3	0.8	2.9	2.2	2.0	0.6	2.1	0.3	0.2	0.5	0.2	0.5
Boron	0.5	0.4	0.5	0.6	0.4	0.5	0.5	0.4	0.4	0.5	0.5	5.6
Cadmium	0.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.06
Calcium	180	210	210	210	340	185	500	140	380	500	110	242
COO	237	160	244	206	473	115	1070	298	275	780	79	162
Chloride	48	103	58	52	65	109	132	79	69	61	32	363
Chromium (Total)	0.04	0.02	0.09	0.04	0.12	0.01	0.07	0.0	0.0	0.38	0.0	0.01
Chromium (+6)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Copper	0.46	0.13	1.1	0.31	0.73	0.44	0.68	0.04	0.13	2.3	0.04	1.2
Cyanide												0.0
Fluoride	0.4	0.7	0.7	0.3	1.0	0.7	0.7	0.3	1.2	0.8	0.3	0.5
Hardness	501	884	549	630	528	637	777	496	1664	279	419	1080
Iron	51.0	30.5	86	90	18	62	13	4.1	39.0	340	5	18
Lead	0.10	0.15	0.26	0.2	0.31	0.0	0.27	0.0	0.0	7.3	0.07	0.44
Magnesium	0.09	90	79	72	100	49	205	24	100	209	24	82.5
Manganese	5.1	3.8	4.2	3.4	4.2	1.9	9.8	0.98	4.5	8.0	1.1	3.9
Mercury	0.0	0.0	0.0002	0.0	0.0	0.0	0.0	0.0001	0.0	0.0	0.0	0.0001
Nickel	0.1	0.1	0.9	0.1	0.8	0.1	0.3	0.0	0.5	1.9	0.0	0.3
Nitrate-Nitrite	0.1	0.1	0.1	0.4	0.0	0.1	0.1	1.1	0.0	0.4	0.5	0.0
pH	6.6	6.6	6.5	6.6	6.6	6.5	6.4	6.6	6.3	6.7	7.0	6.4
Phenolics	0.0	.01	0.0	0.005	0.0	0.065	2.5	0.01	0.45	0.015	0.0	0.875
Phosphorus	2.9	1.2	3.3	2.7	6.0	1.8	9.4	.18	.72	16	.24	.69
Potassium	10.6	13.1	13.4	12.3	22	7.7	15.2	13.7	14.9	29	4.9	58
A.O.E.	650	1230	765	790	824	1020	1230	704	2460	508	512	2130
Selenium	0.003	0.001	0.004	0.01	0.008	0.001	0.004	0.001	0.001	0.005	0.002	0.001
Silver	0.01	0.0	0.2	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.02	0.11
Sodium	24	60	40	29	57	96		40	40	53	24	260
S.C.	870	1500	1050	1080	1040	1340	1430	960	2470	720	490	
Sulfate	132	434	230	204	296	281	201	103	1348	93	104	518
Z	0.6	0.4	6.2	0.3	3.7	0.1	0.8	0.0	0.1	8.0	0.0	7.8
PCB (ppb)	1.0	1.2	-	-	-	-	-	-	-	2.7	-	-
Chlorophenol (ppb)	-	1200	-	-	-	-	630	-	19	-	-	-
Chlorobenzene (ppb)	-	-	-	-	-	-	19	-	-	-	-	100
Dichlorobenzene (ppb)	-	-	-	-	-	-	25	-	-	-	-	65
Dichlorophenol (ppb)	-	-	-	-	-	-	890	-	-	-	-	-
Cyclohexanone (ppb)	-	-	-	-	-	-	-	-	120	5.9	-	-
Chloroaniline (ppb)	-	-	-	-	-	-	-	-	-	-	-	3500

NOTE: All results in ppm unless otherwise noted.
Blanks indicate parameter not analyzed.
- indicates below detection limits.

TABLE B-7: ANALYSIS OF GROUNDWATER SAMPLES FROM THE IEPA MONITORING WELLS
(COLLECTED 1-28-81)

PARAMETERS	SAMPLE LOCATIONS											
	G101	G102	G103	G104	G105	G106	G107	G108	G109	G110	G111	G112
Alkalinity	447	421	266	520	363	556	621	448	18	308	394	619
Ammonia	0.3	0.0	1.4	0.2	0.7	3.3	1.0	0.0	17	0.2	0.1	0.5
Arsenic	0.015	0.016	0.018	0.002	0.037	0.11	0.021	0.004	7.5	0.013	0.014	0.027
Barium	0.9	1.2	0.9	0.3	1.8	1.0	3.2	0.5	0.2	1.0	0.7	0.5
Boron	0.3	0.4	0.4	0.7	0.4	0.5	0.5	0.2	0.8	0.2	0.6	0.9
Cadmium	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00
Calcium	220.0	328.9	176.3	218.0	319.2	225.5	1169.5	205.5	466.7	169.4	181.4	198.3
C.O.D.	45	93	56	9	143	212	635	8	1315	37	28	47
Chloride	20	128	64	29	59	156	201	76	32	36	18	210
Chromium (Total)	0.02	0.02	0.02	0.00	0.03	0.00	0.09	0.00	0.04	0.02	0.02	0.00
Copper	0.59	0.79	0.36	0.14	0.43	0.29	0.97	0.00	94.1	0.11	0.04	0.28
Cyanide	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Hardness	554	1072	490	717	764	617	960	564	2144	447	530	486
Iron	30.4	16.5	20.8	1.4	60.8	67.5	172	0.3	198	19.1	10.1	18.9
Lead	0.17	0.08	0.00	0.00	0.07	0.00	0.32	0.00	0.00	0.00	0.00	0.00
Magnesium	48.2	78.0	46.3	49.1	73.6	49.1	288.1	34.3	184.4	43.5	37.9	54.0
Manganese	3.02	3.15	3.07	1.41	4.10	2.13	9.64	0.34	8.30	0.77	1.76	2.78
Mercury	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0004	0.0	0.0	0.0
Nickel	0.1	0.1	0.4	0.0	0.2	0.0	0.5	0.0	176	0.9	0.0	0.0
Nitrate-Nitrite	0.0	2.5	0.1	0.5	0.0	0.0	0.2	3.5	0.3	18	0.5	0.0
pH	7.0	7.0	7.1	7.2	7.0	6.9	6.9	7.1	4.1	6.9	7.0	6.9
Phenolics	0.0	0.0	0.0	0.0	0.0	1.46	0.5	0.01	1.86	0.02	0.015	0.05
Phosphorus	0.91	0.88	0.41	0.06	3.6	2.1	10	0.03	3.7	1.0	0.51	0.53
Potassium	6.4	12	8.8	6.0	13	6.2	20	16	18	7.5	4.2	20
Selenium	0.002	0.002	0.002	0.002	0.003	0.002	0.011	0.004	0.006	0.016	0.002	0.0
Silver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sodium	13	63	48	15	50	94	60	30	37	13	14	18
Sulfate	129	583	256	265	468	143	276	86	3371	57	153	212
Zinc	0.3	1.2	1.8	0.1	1.5	0.1	1.5	0.0	10.1	2.0	0.1	2.8
PCB (ppb)	0.22	3.9	-	0.3	-	-	0.4	-	-	-	-	-
Chlorobenzene (ppb)							6.3	-	-	-	-	2.5
Dichlorophenol (ppb)							560	-	-	-	-	-
Chloroaniline (ppb)							90	-	-	-	-	2.1

NOTE: All results in ppm unless otherwise noted.
Blanks indicate parameter not analyzed.
- indicates below detection limits.

TABLE B-8: ANALYSIS OF GROUNDWATER SAMPLES FROM THE IEPA MONITORING WELLS
(COLLECTED 3-10-81 - 3-11-81)

PARAMETERS	SAMPLE LOCATIONS											
	G101	G102	G103	G104	G105	G106	G107	G108	G109	G110	G111	G112
Alkalinity	483	464	319	568	393	594	657	464	58	331	387	400
Ammonia	0.2	0.0	1.5	0.0	0.4	3.0	0.2	0.0	15	0.0	0.1	0.7
Arsenic	0.001	0.0	0.003	0.001	0.013	0.085	0.004	0.001	3.9	0.001	0.001	0.00
Barium	0.0	0.7	0.1	0.2	0.2	0.3	0.1	0.2	0.1	0.1	0.1	0.0
Boron	0.2	0.4	0.3	0.7	0.3	0.5	0.5	0.2	0.5	0.1	0.4	3.4
Cadmium	0.0	0.01	0.01	0.0	0.0	0.0	0.01	0.0	0.07	1.1	0.0	0.17
Calcium	154	333	161	205	218	175	186	148	431	121	164	207
DOO	10	24	47	9	23	146	47	12	930	10	9	52
Chloride	16	124	46	28	57	150	235	51	24	27	16	133
Chromium (Total)	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.0
Copper	0.04	0.06	0.08	0.02	0.02	0.01	0.01	0.03	67	0.02	0.07	0.48
Cyanide	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hardness	542	1062	620	839	796	675	1096	479	1651	424	485	789
Iron	0.3	0.3	1.6	0.0	9.4	4.9	2.4	0.0	1.4	0.0	0.2	0.5
Lead	0.0	0.0	0.0	0.0	0.0	0.06	0.0	0.0	0.0	0.0	0.07	0.0
Magnesium	34.2	77.9	41.9	56.8	47	44.8	44.8	22.3	138	28.7	31.8	72
Manganese	2.0	2.98	3.51	0.61	2.32	1.62	2.12	0.23	6.22	0.14	1.02	2.1
Mercury	-	-	-	-	-	-	0.0002	-	0.0003	-	-	-
Nickel	0.0	0.3	1.1	0.0	0.2	0.0	0.0	0.1	123	1.2	0.0	0.4
Nitrate-Nitrite	0.0	1.1	0.0	2.3	0.0	0.0	0.0	0.3	0.3	15	2.7	0.2
pH	6.9	6.8	6.8	6.9	6.8	6.7	6.7	7.0	4.6	6.6	6.8	6.6
Phenolics	0.0	0.0	0.005	0.0	0.0	0.0	1.7	0.1	1.4	0.0	0.0	0.00
Phosphorus	0.0	0.08	0.03	0.02	0.1	1.5	0.03	0.02	2.2	0.01	0.01	0.03
Potassium	4.0	10.8	10.4	5.9	8.9	5.7	2.8	18.2	6.4	6.3	2.9	40.2
Selenium	0.0	0.0	0.001	0.003	0.0	0.0	0.0	0.001	0.003	0.018	0.001	0.0
Silver	0.01	0.02	0.0	0.0	0.02	0.01	0.01	0.0	0.0	0.01	0.01	0.01
Sodium	11	64	65.6	17.4	51.2	92.6	39.2	25.2	12.1	14.2	15.5	96.6
Sulfate	118	617	471	303	466	146	313	55	2629	61	147	544
Zinc	0.1	0.8	2.8	0.1	0.3	0.1	0.1	0.3	6.3	1.8	0.1	11.8
PCB (ppb)	0.13	0.46	-	0.1	-	2.4	0.37	-	-	0.9	-	2.0

NOTE: All results in ppm unless otherwise noted.
Blanks indicate parameter not analyzed.
- indicates below detection limits.

was 6.3, 4.1, and 4.6 during the three sampling events. This indicates an unidentified source was releasing acid to the groundwater. Other wells which exhibited significant inorganic contamination include G102, G103, G105, and G106, all of which are located adjacent to CS-8 along the west side. The data indicates non-uniform ground water contamination in the area, likely resulting from a variety of polluttional sources.

Private wells in the area have been periodically sampled by the IEPA and the USEPA. These wells are no longer used for potable water, but they are used for watering lawns and gardens. Locations of private well samples in the Dead Creek area are shown in Figure B-2. IEPA sampled five residential wells and collected one basement seepage sample near Creek Sectors B and C. Analytical data for these samples are presented in Table B-9. G504, located east of CS-8 on Judith Lane, exceeded the standard for copper. The wells all showed water quality similar to that found in IEPA monitoring well G108, indicative of background conditions in the area. The basement seepage sample was collected from a residence on Walnut Street, just east of Site M. Analysis of this sample indicated higher levels of barium and copper, when compared with the private well samples. The seepage sample (x301) also showed a measurable level of chlordanes, which was likely due to the application of commercial pesticides.

In March, 1982 the USEPA collected ground water samples from four private wells (S01, S02, S03, and S06) and two IEPA monitoring wells (S04 and S05). Ground water samples S04 and S05 correspond to IEPA monitoring wells G102 and G101 respectively. In addition, soil samples (S07 S10, S11) were collected from three gardens where well water is used for watering. Soil Samples S07, S010, and S011 were collected from gardens at the locations of ground water samples S01, S02, and S03 respectively (see Figure B-2 for approximate sample locations). Water and soil blank samples, R09 and R12 respectively, were also collected and analyzed. Analytical data for these samples are presented in Tables B-10 and B-11.

TABLE B-9: ANALYSIS OF RESIDENTIAL WELL AND
SEEPAGE SAMPLES COLLECTED BY IEPA

SAMPLE DATES AND LOCATIONS

PARAMETERS	9/16/80	9/16/80	9/16/80	9/23/80	6/8/83	1/5/83
	G501	G502	G503	G504	G505	x301
Arsenic	0.008	0.004	0.001		0.01	0.017
Barium	0.2	0.16	0.39	0.05	0.4	1.1
Boron	0.28	0.27	0.25	0.58	0.4	0.3
Cadmium						
Chromium						
Copper	0.02			0.06	0.01	0.03
Iron	4.6	19	17.7	0.73	26	31
Lead						0.03
Magnesium	33	39	36	30	35.3	54
Manganese	1.02	1.26	0.79	0.65	1.3	1.49
Mercury				0.0001		
Nickel				0.02		0.1
Phosphorus				0.02	0.62	1.2
Potassium	6.6	5.7	4.5	6	6.2	6.4
Silver						
Sodium	21	24	12	26	15.2	19
Zinc	0.85		0.18	0.8		0.7
PCBs	-	-	-			
Chlordane (ppb)	-	-	-	-		0.13

NOTE: All results in ppm unless otherwise noted
Blanks indicate below detection limit
- Indicates parameter not analyzed
Sample x301 was collected from basement seepage

TABLE B-10: ANALYSIS OF IDENTIFIED ORGANICS IN GROUND WATER
AND SOIL SAMPLES IN THE VICINITY OF CREEK SECTOR B
(COLLECTED BY USEPA 3-3-82)

PARAMETERS	SAMPLE LOCATION										
	S01	S02	S03	Ground Water		S06	R09	S07	Soil		R012
				S04	S05				S010	S011	
bis(2-ethylhexyl) phthalate	64	62			19	a				a	0.44
di-n-butyl phthalate	a	a	a	a	11	a				a	a
diethyl phthalate	a	a	a	a			a				
3,4 benzofluoranthene	a										
benzo(k) fluoranthene	a										
butyl benzylphthalate				a			a				
methylene chloride	16	16	2300	3100	990	2000	19	1	0.1		0.75
1,2-dichlorobenzene				a							
1,4-dichlorobenzene				a							
chlorobenzene				a	a						
heptachlor				0.11b	0.146						
beta-BHC				0.18b	0.3b	4.04b					
gamma-BHC				0.16b	0.25b						
alpha-BHC					0.18b	0.25b					
aldrin				0.17b							
dieldrin								0.012		0.0046	
chlordane									0.11b		
heptachlorepoide						1.46b					
delta-BHC						0.95b					
fluoranthene							a			a	
benzo(a) anthracene							a			a	
anthracene							a				
pyrene							a			a	
Chrysene										a	0.02b

NOTE: All results in ppb
Blanks indicate below detection limit
a - Compound detected at value below specified contract detection limit
(compound identified as present, but not quantified)
b- value not confirmed by GCMS
Samples R09 and R012 are water and soil blanks, respectively

TABLE 8-11: INORGANIC ANALYSIS OF GROUND WATER AND
SOIL SAMPLES IN THE VICINITY OF CREEK SECTOR B
(COLLECTED BY USEPA 3-3-82)

PARAMETERS	GROUND WATER - in PPB						SOIL IN PPM			
	S01	S02	S03	S04	S05	S06	S07	S010	S011	R012
Aluminum		400	390		940	1,200	750	600	430	
Antimony										
Arsenic	11			29			1.3	1.0		
Barium							80	80	80	
Beryllium										
Boron	10,500	11,000	8,000	1,800	140	110				
Cadmium	4.2	14	31	5.3		2.8	1.06	1.64	0.29	
Chromium	12						2.2			3.2
Cobalt	62	70	82	95						
Copper	65						16	24	13	
Iron	65,000	31,000	38,000	28,000	530	250	340	360	240	
Lead	570	97	74	9	11	10	(45)	(20)	(25)	
Manganese	1,600	1,100	1,500	5,100	460	80	120	630	134	
Mercury										
Mercury*	0.1	0.4	0.4	0.2	0.1					
Nickel							6.5	5.5	4	
Selenium										
Silver										
Thallium										
Tin										2
Vanadium										
Zinc	107,000	109,000	40,000	1,900	260	350	96	77	130	

NOTE: Blanks indicate below detection limits
() - Results did not meet USEPA Quality Control criteria - Data unreliable
* Duplicate analysis performed by USEPA central regional laboratory
Samples R09 and R012 are water and soil blanks, respectively

Quantified levels of bis-(2-ethylhexyl) phthalate were found in wells S01, S02, and S05. In addition, seven compounds from the pesticide fraction were detected in Wells S04, S05 (IEPA wells), and S06. Diethyl phthalate, butyl benzylphthalate, and methylene chloride were detected in the water blank, indicating that values of these parameters found in other samples should be disregarded. Methylene chloride was used to decontaminate sampling equipment, and concentrations of this parameter in all samples should not be considered indicative of aquifer conditions. Water quality standards for lead and cadmium were exceeded in one or more wells.

The soil samples showed trace levels of chlordane and dieldrin. It could not be determined if levels of pesticides found in the gardens soils were attributable to the use of well water or application of commercial pesticide products to the gardens. Phthalates, methylene chloride, chrysene, and chromium were detected in the soil blank (R012), and these compounds should be disregarded in other samples.

In September and October, 1980 IEPA conducted preliminary air monitoring in CS-8. The survey included use of detector tubes (Drager) for halogenated hydrocarbons, and collection of air samples in charcoal tubes with subsequent laboratory analysis. The detector tubes showed positive readings for hydrocarbons in the northern portion of CS-8, adjacent to the former Waggoner Building. Results were not quantified, and negative readings were observed in all other areas surveyed. Air samples were collected from two locations in CS-8 using charcoal tubes and sampling pumps. Two samples were collected from each location in order to monitor conditions for undisturbed and disturbed soil. Samples from the first location, 40 yards south of Queeny Avenue, showed no positive readings for volatile organic compounds (VOCs) for disturbed or undisturbed soil conditions. Xylene was detected for disturbed and undisturbed soil conditions at the second sampling location, which was 60 yards north of Judith Lane, adjacent to Site M. All samples were extracted and analyzed at IEPAs Springfield Laboratory.

A USEPA Field Investigation Team (FIT) contractor also performed an air monitoring survey in the creek bed in March, 1982. This survey involved the use of an organic vapor analyzer (OVA), an HNU photoionizer, and Drager detector tubes for phosgene gas. Results indicated that a small, but measurable, concentration of organic vapors were present in the breathing zone (5 feet above ground surface), with concentrations increasing closer to the creek bed. In the breathing zone, the OVA showed readings up to 0.5 ppm above background, and the HNU readings were as high as 9 ppm above background. The survey crew also observed a 3-inch effluent pipeline adjacent to the former Waggoner Building which was discharging a small stream of oily liquid. OVA and HNU readings were taken approximately 6 inches from the surface where this liquid had pooled. The OVA showed concentrations up to 350 ppm, and the HNU showed concentrations ranging from 400 to 900 ppm in this area. Phosgene gas was not detected in any area using the Drager tubes.

HRS scores have been calculated on two separate occasions for Dead Creek. The creek was first scored in July, 1982, by Ecology & Environment, Inc., with a final migration score of 18.48. The site was again scored in March, 1985 by IEPA in an attempt to increase the previous score. IEPA's assessment led to a final score of 29.23, however, this score has not been finalized by USEPA. Route scores for the 1982 assessment were as follows: ground water 4.24, surface water 7.55, and air 30.77. Corresponding route scores in the 1985 assessment were 5.65, 10.07, and 49.23. Observed releases were used for all route scores in both the 1982 and the 1985 scoring packages. The only difference in the assessments was in the value assigned for waste quantity in the three routes. The 1982 package listed waste quantity as unknown (assigned value - 0), while IEPA calculated an approximate volume of waste based on sample results and visual observations.

A significant amount of data has been developed showing a wide range of contaminants in and around CS-8. Review of existing file data indicates numerous possible sources of contamination in the area.

Prior to blocking the culvert at Queeny Avenue, Cerro Copper and Monsanto Chemical reportedly discharged process wastes directly into the creek. According to past IEPA inspection reports the former Waggoner Company, an industrial waste hauling operation, discharged wash waters from truck cleaning activities directly to CS-B. After IEPA order Waggoner to cease this practice, an unlined surface impoundment was apparently used for disposal of wash water. In the 1940s and 1950s sites H and I were used for disposal of various industrial wastes. These sites were actually a single, large disposal area prior to the construction of Queeny Avenue in the late 1940s. In the 1950s, the Midwest Rubber Company, located west of State Route 50 and south of Queeny Avenue, had an effluent pipeline which ran from their plant location to the northern portion of CS-B. Midwest Rubber Co. reportedly discharged process wastes, including oils and cooling water, to the creek. Site G is a surface/subsurface disposal area with corroded drums and other wastes exposed on the surface. Surface drainage for at least a portion of this site is directed to CS-B.

Data Assessment and Recommendations

The scope of field investigation work for CS-B during the Dead Creek Project includes collecting three surface water samples from the Creek in Sector B. This sampling program should be sufficient to characterize the water currently in the creek. Soil gas and ambient air monitoring will also be done in and around CS-B.

Although a great deal of data is available for CS-B, most of the data is 4-6 years old. Because of the dynamic nature of the creek and disposal activities in the area, existing conditions may not be accurately characterized by historical sampling data. Feasibility study activities for CS-B could be accomplished using existing data and applying assumptions concerning chemical profiles (contaminant distribution). However, to properly accomplish the feasibility study activities, a current chemical depth profile of the creek bed should be developed. This would consist of collecting

sediment and subsurface soil samples from several locations in the creek bed and along the banks. The hydrology of the area has not been well-defined and should be addressed further. It has not been established whether the ground water discharges to Dead Creek or the creek acts as a recharge conduit for the Henry Formation aquifer. If discharge to the creek is occurring, the subsurface disposal areas (Sites H and I in particular) may be major contributors to the contamination of the creek.

Accordingly, existing IEPA monitoring wells on both sides of the creek should be redeveloped to allow for accurate water level measurements. This, in conjunction with detailed surveying of the creek bed and water levels in the creek, would allow adequate assessment of the hydrology in the area. This would be best accomplished using continuous-recording water level instrumentation, and should be continued over a period of time sufficient to address seasonal fluctuations. In addition, records of industries in the area should be thoroughly reviewed to establish a profile of possible releases from each source.

SECTORS C THROUGH F - DEAD CREEK

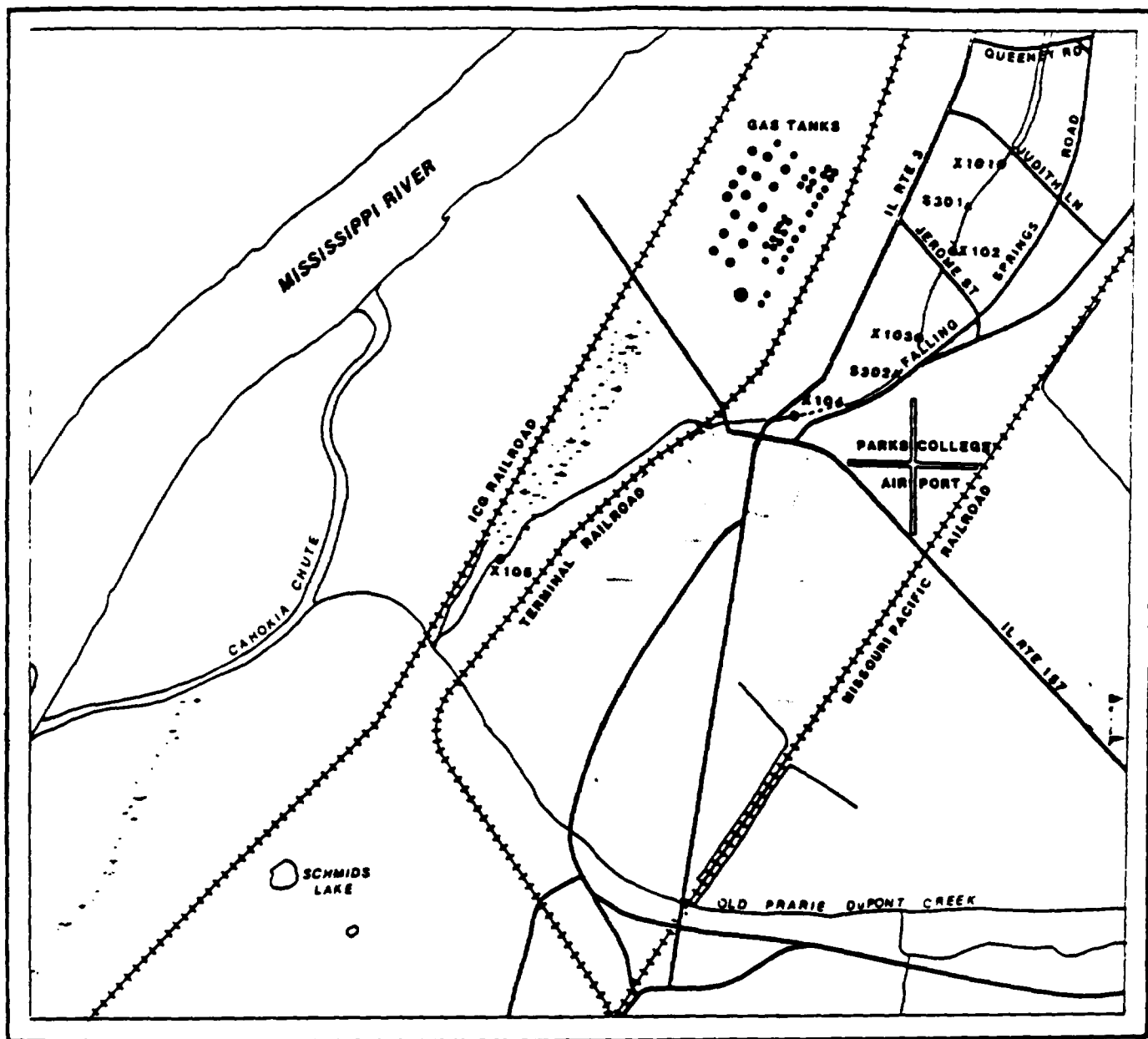
Site Description

Creek Sectors C through F include the entire length of Dead Creek south of Judith Lane. This portion of the creek flows south-southwest through the Village of Cahokia prior to discharge into the Prairie DuPont floodway. The floodway subsequently discharges into the Cahokia Chute of the Mississippi River. The creek is somewhat wider through these sectors than in sectors A and B, and is not as heavily vegetated as Sector B. Creek Sectors C through F are delineated as follows: CS-C- Judith Lane to Cahokia Street, CS-D - Cahokia Street to Jerome Street, CS-E - Jerome Street to the intersection of State Route 3 and State Route 157, CS-F - intersection (as above) to the discharge point in the old Prairie DuPont Creek.

Site History and Previous Investigations

There are no known discharges to Dead Creek south of Judith Lane, although several apparent discharge pipes have been observed during preliminary reconnaissance. Site N of the Dead Creek Project is located immediately east of the creek in the southern portion of CS-C. Land use in the vicinity of Sectors C through F is residential/commercial for the most part. The creek flows underground through a culvert in the southern part of CS-E near Parks College. Although the Culvert under Judith Lane has reportedly been blocked, flow emanating from the culvert has been observed on several occasions.

IEPA collected five sediment and two surface water samples from creek Sectors C through F as part of their Preliminary Hydrogeological Study conducted in 1980. Locations of these samples are shown in Figure C-1, and analytical data is presented in Table C-1. The water samples showed very little evidence of contamination, although concentrations of copper exceeded the IEPA's water quality



SCALE
0 0.5 1 mile

LEGEND
X101 SEDIMENT SAMPLING LOCATION
S301 SURFACE WATER SAMPLING LOCATION
RESIDENTIAL AREA

FIGURE C-1
IEPA SAMPLING LOCATIONS CREEK SECTORS C THROUGH F

MCO 6565843

TABLE C-1: ANALYSIS OF SURFACE WATER AND SEDIMENT
SAMPLES FROM CREEK SECTORS C THROUGH F
(COLLECTED BY IEPA 9-25-80)

PARAMETERS	SAMPLE LOCATIONS						
	Water		Sediment				
	S301	S302	x101	x102	x103	x104	x105
Aluminum			12,000				
Arsenic	0.008	0.006	26				
Barium	0.12	0.08	1,300	4,700	210	390	475
Beryllium	-	-	-	3	-	2	-
Boron	0.06	0.04	-	76	-	-	-
Cadmium	-	-	-	50	8	31	2
Calcium			24,000	5,300	210,000	16,000	13,000
Chromium	-	0.01	400	50	60	50	-
Cobalt			40	32	6	8	9
Copper	0.26	0.04	15,000	17,200	320	1,800	360
Iron	0.66	0.87	57,000	110,000	11,000	19,000	18,000
Lead	-	-	800	1,300	260	250	75
Magnesium	3	2	7,100	2,000	10,000	5,100	3,300
Manganese	0.03	0.12	600	170	210	160	200
Mercury			1.2				
Nickel	0.05	0.01	2,000	2,300	45	600	-
Phosphorus	0.19	0.2		6,200	720	1,200	4,200
Potassium	6.6	3.3	2,400	900	1,400	2,100	1,400
Silver	-	-	-	45	10	-	-
Sodium	3	3	800	1,100	100	190	125
Strontium	0.08	0.07	100	140	210	47	43
Vanadium	-	-	-	50	22	31	35
Zinc	0.24	-	12,000	21,000	900	5,600	780
PCB	-	-	0.12	0.12	2.8	2	-

NOTE: All results in ppm.
Blanks indicate parameter not analyzed.
- Indicates below detection limits.

C-3

MCO 6565844

standard in both samples. This was the only parameter in either sample which exceeded the standards.

The sediment samples contained relatively high concentrations of cadmium, chromium, copper, lead, nickel, and zinc. Concentrations of these parameters were several times higher than those found in the background soil sample in the IEPA study (sample x121; see Creek Sector B, Table B-3). Arsenic was also detected in sample x101, but was not analyzed for in the other downstream samples. The highest concentrations of aluminum (12,000 ppm) and boron (76 ppm) in the IEPA study were found in downstream sediment samples x101 and x102, respectively. PCB was the only organic compound detected in the downstream sediment samples, with the highest concentration (2.8 ppm) found in x103. Sample x105 was the only downstream sample that did not contain PCBs. These results illustrate the uneven distribution of contaminants within Dead Creek. While some contaminants in Sectors C through F are lower than in CS-B, barium, cadmium, chromium, lead, and nickel were detected in comparable or higher concentrations than sediments in upstream samples. This could be attributable to the mechanical properties of stream flow, such as gradient, channel dimensions, and flow velocity, or to the existence of unknown contaminant sources located in downstream areas.

Data Assessment and Recommendations

The scope of work for these sectors of the creek during the Dead Creek project includes collecting the following samples: CS-C, 2 surface water, 2 sediment; CS-D, 1 surface water, 2 sediment; CS-E, 3 surface water, 10 sediment; and CS-F, 4 surface water, 10 sediment. The sampling in CS-F will be postponed, pending review of data from the other creek sectors. A soil gas survey and ambient air monitoring will also be conducted in and around Creek Sectors C through E.

For Creek Sectors C through F, waste characterization for the feasibility study activities could be completed with sampling as

proposed provided assumptions regarding chemical profiles are made. However, in order to accurately estimate waste quantities and define to what depth contamination has occurred, a more detailed sampling program is necessary. This would include developing a depth profile of chemical constituents in the creek bed. Cores should be taken from upstream and downstream locations, with additional sampling at point sources as necessary.